

APRIL 9, 1942

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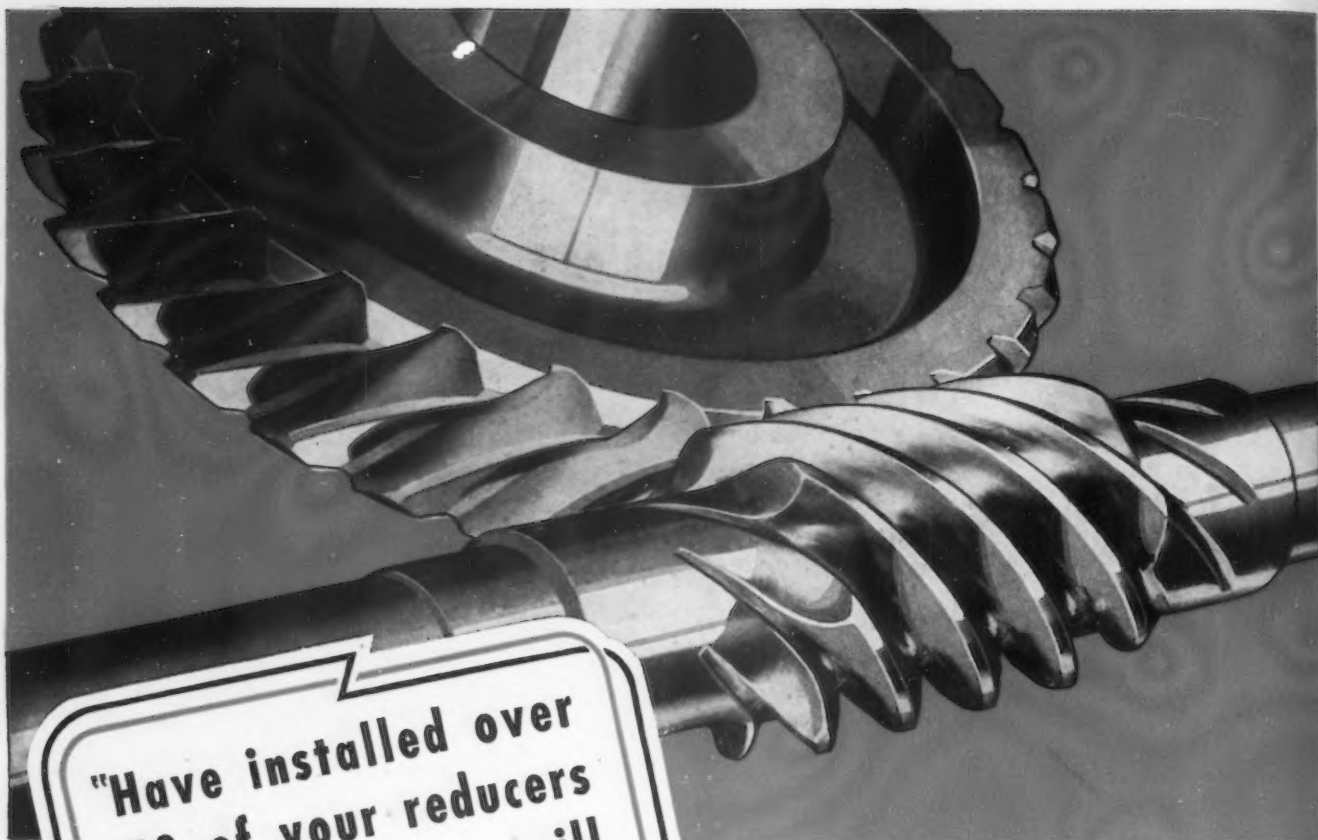
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*Speed Reducers*



APRIL 9, 1942

VOL. 149, NO. 15



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# THE IRON AGE

• •  
APRIL 9, 1942

• •  
ESTABLISHED 1855



## *More Head Work, Less Foot Work*

**T**HIS year we will put into American factories nearly as many new machine tools as we would have put into them in a previous normal decade.

This year and next, we will train and induct into our manufacturing industries as new workers, either additions or replacements, nearly as many men and women as were employed in all of our manufacturing industries in the boom year of 1929.

It means just this: Under the spur of war, we are giving our productive capacity and our technical skill a boost which in two years would equal what could be expected in from 10 to 20 years of normal progress.

Think of what this means to the present and to the future of merchandising.

Normally, production follows sales.

In the course of normal events, we could have expected, with sales leading production, to have arrived in 1953 at the productive capacity position we will be in 1943.

When the war is over we will find Production 10 years too big for his breeches. There will be but these two alternatives. Either put Production on a Hollywood reducing diet and risk anemia, or make him a new pair of pants.

Merchandising is the only tailor who can do that.

The immediate job facing the selling profession is to get so smart that it can catch up with production. That's a big job, but not an impossible one.

With this big job to do, it seems to me to talk or think about dismantling sales organizations or scuttling merchandising ships; to contemplate putting salesmen or advertising on the shelf or elsewhere where skill will dry up and blow away is so foolish as to be laughable were it not so sadly suicidal.

Today we need production to save America. But tomorrow we are going to need super-selling to save both production and America.

No good industrial executive would let his plant and equipment run down, even if it were to be idle for a time. He would keep the machines greased, the water and steam lines in repair and the power house in tip-top condition.

And yet, in some cases, the same executive will throw his sales organization on the scrap pile simply because he cannot see enough leg work ahead to keep them busy.

There may not be as much leg work to be done in our sales department today, but there is more head work needed there than ever before.

*J. H. Vandeventer*





Photo by U. S. Army Signal Corps

## Tough Steel for Secret Process Made by Inland for Government Arsenal

Special steel for small and large calibre guns is made by Inland for a Government Arsenal. The gun barrels are manufactured by a secret process and require an especially tough, high-quality carbon steel. Thousands of tons of this steel already have been made by Inland, and a large tonnage continues to flow to the Government Arsenal.

Production of this steel to exacting specifications begins with the careful selection and blending of raw materials. Furnaces must be in perfect condition; temperatures are controlled to the nth degree. Expert steelmakers and highly trained metallurgical technicians supervise each phase of production, from blending of raw materials to final inspection. As many as a hundred test samples are often taken as the heat progresses to

make sure the chemical analysis is exactly right. A heat is immediately rejected if it does not safely meet every rigid requirement.

Ingot molds are thoroughly cleaned and prepared for hot topping. Billets are heavily cropped, chipped and ground to eliminate all possible defects. Every ton of this special Inland gun barrel steel must pass the critical examination of U. S. Government inspectors before shipment.

Inland has had many years of experience in making steels to meet special requirements. We are glad now to be able to turn this skill to the production of steel for gun barrels—and for bombs, ships, tanks and all else needed for Victory in the war against aggressor nations.

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# Desulphurizing Pig Iron

... This report of German research into desulphurization practice has especial significance for the U. S. steel industry as it strains to meet the ever increasing war demand for pig iron supplies. The tapping of new ore sources, in particular, has intensified the need for more complete data on this subject.

**C**HANGES in the raw material basis, particularly the exploitation of new ore resources, have directed increased attention to the economic desulphurization of pig iron. A review (report No. 191) of developments in this direction by the blast furnace committee of Verein Deutscher Eisenhüttenleute, published recently in *Stahl und Eisen*, describes some research undertaken at the works of August Thyssen Hütte A.G. to establish the comparative efficiency of various desulphurizing processes.

The review points out that much care is required in taking samples, for the sulphur is rarely uniformly distributed, and tapping is usually found to drop off at the end of the run. Thus, an initial sulphur value of 0.18 per cent has been observed to drop to 0.09 per cent at the end of the tap; in another case the extreme values were 0.168 and 0.046 per cent, or, over a range of 4:1. Samples should, therefore, be taken at intervals throughout a tap and an average calculated from these.

This wide difference in the sulphur content throughout a tap suggests that desulphurization might be effected in the blast furnace itself, by maintaining a sufficient amount of a reactive slag over the molten charge. The marked drop in sulphur content is due to the fact that if enough slag is present in the furnace, the drops of iron become desulphurized in their passage through the slag, so that the thicker the slag cover, the greater the de-

gree of desulphurization. For instance, W. Oelsen points out that sodium silicates can remove appreciable quantities of iron sulphides from molten charges.

The authors point out that desulphurization of pig iron in the blast furnace through the medium of a furnace slag was actually patented in Germany in 1907.

## Soda Ash and Lime

Following laboratory experiments, observations were conducted, the review states, on over 200 tapings with each of two blast furnaces; one operating with soda ash and the other with a mixture of soda ash and lime. The vast amount of data collected did not reveal any

clear and simple connection between the degree of desulphurization and the proportions of Si and Mn at the start of the process and their variation during tapping, or with the temperature of the iron.

The effect of the initial sulphur value was, however, pronounced, for desulphurization became more effective as the sulphur value increased, using the same amount of soda ash. The increase was not exactly a direct proportion, as desulphurization could not be taken beyond 50 to 60 per cent. The desulphurizing action was better in furnace A than in furnace B (Table I). There was also a greater reduction in silicon content when using soda ash alone, in spite of a low initial concentration, than when using a soda-lime mixture. The reduction in manganese was roughly the same in both cases. The degree of S and Mn reduction indicates that the S removed by soda ash was not wholly present as manganese sulphide. The results of these experiments are summarized in Table I.

In addition, comparative tests were made with two ladle charges tapped at the same time from the same furnace. One 30-ton charge received 440 lb. soda ash and the other a series of mixtures of soda ash and lime, with soda-lime ratios of 198/198, 264/198, 264/264, 330/198, 330/264 lb. Again, the higher initial sulphur showed a better soda ash reaction, the reactivity increasing with sulphur content more rapidly when

TABLE I  
Desulphurization Experiments

		Furnace a	Furnace b
Temperature, deg. F.		2,500	2,480
Amount of soda ash, lb. per ton pig iron		14.52	16.17
Amount of lime, lb. per ton pig iron		7.9	—
		Per Cent	Per Cent
Iron tapped	S	0.097	0.105
	Si	0.69	0.50
	Mn	0.65	0.95
Reduction in S	Relative	54.	66.
	Absolute	0.052	0.069
Reduction in Si	Relative	20.5	26.
	Absolute	0.14	0.13
Reduction in Mn	Relative	9.3	7.
	Absolute	0.06	0.065
Efficiency of soda ash		28.8	32.4



using the mixtures than with plain soda ash.

High S values are usually associated with low iron temperatures, and owing to their greater quantity, the effect of the mixtures is limited as compared with soda ash alone. The general conclusion already drawn by Oelsen was confirmed, viz., that the lower the final S value required in the pig-iron, the less must be the amount of S removed per unit mass of the desulphurizing agent.

The final S value is just as important as the initial S content, sulphur elimination being after all the object of the process. The relationship between final and initial S values when using different mixtures can be indicated graphically, the plot serving to give the most suitable mixtures for any particular terminal S values. Discussing this question, the review indicates that the marked superiority in certain cases of a 4:3 soda ash/lime mixture over a 5:3 mixture and plain soda ash, this result applying only to reaction in the blast furnace and as confirmed by experiments at three iron works.

#### Double Na-Ca

Oelsen has called attention to the formation of a double carbonate on fusing together soda ash and  $\text{CaCO}_3$  (limestone); this carbonate melts at 1530 deg. F. or some 120 deg. lower than soda ash. It would appear that this salt should exercise a powerful desulphurizing action, especially in the fluid state. In experimental work in conjunction with the Kaiser Wilhelm Institute für Eisenforschung, the double salt was molten and then added to the iron, when it caused violent reaction. Contrary to expectation, desulphurization was found to be less efficient than with plain soda ash; the same result was obtained with the sintered carbonate.

The reason for this failure is that the highly fluid salt after reaction forms a very viscous slag, which may solidify and then become totally ineffective. Experiments were also conducted to find a difference, if any, between the action of solid and molten soda ash; with an initial sulphur of 0.10 to 0.13 per cent, sulphur elimination was between 10 and 15 g. of S per kg. (2.20 lb.) of solid soda ash better than with the molten reagent.

Various advantages accrue if desulphurization is effected after the mixer, for: (1) The pig-iron poured from the mixer contains no fur-

nace slag and none of the silica which in a fine state of division is mixed with the iron; (2) temperatures are more uniform than in the furnace; (3) initial sulphur being more uniform the amount of soda ash to be added can be more accurately determined; (4) a constant-weight charge can be used in the ladle and hence the amount of soda ash added can be standardized; (5) the final S value can be adjusted as required for subsequent operations; (6) the use of molten soda ash is simplified; (7) a lower-lime and richer-alkali slag is obtained; (8) there is better protection against soda-ash dust, and (9) the durability of the mixer is increased as no soda slag residues reach the mixer.

The disadvantages are the lower temperature of the pig iron and hence lower reactivity of the desulphurizing agent, and also a probable reduction in converter life and in desulphurizing efficiency in the converter, owing to the presence of the soda slag.

#### High Mixer Output

Experiments show that good results can only be achieved if the output of the mixer is maintained fast enough to keep the pig iron hot. In the main experiment 3500 tons of non-desulphurized iron was passed through the mixer and the temperature kept at the right level. In the first trials the amount of soda ash used was intentionally taken very high; later it was reduced. Normal desulphurization was obtained up to the 60th experiment, after which a reduction in the furnace temperature caused

the sulphur to reach a maximum of 0.16 per cent, which naturally reacted adversely on the Mn reduction.

Desulphurization to below 0.04 per cent was achieved in the exceptional cases only, irrespective of the amount of soda ash added. Tests showed that even small quantities of soda ash are sufficient to desulphurize down to normal levels, that is, 0.105 to 0.12 per cent S with about 7 lb. soda ash per ton.

Further tests with soda ash/lime mixtures gave negative results, and even if the quantity of soda ash in the mixture was the same as with soda ash alone, the desulphurizing action was reduced by the presence of lime. The greater heat absorbed by the mixture adversely affects the temperatures after the mixer, and the slag becomes very viscous and inert. The soda ash required for desulphurization behind the mixer is roughly half that needed for a similar result in the furnace. It is not always possible to reduce the S content below a certain final value by continually increasing the amount of soda ash added. The practice is, therefore, to use just as much soda ash as will be sufficient to reduce the S to the required final value, taking as a guide the data given in Table II.

A point to be noted is that the soda slag must not pass into the converter when the charge is poured into the ladle; the authors recommend the use of a slag catcher of the type adopted at Corby, which permits part of the slag to be used again and thus reducing soda-ash consumption.

#### Desulphurizing With Lime

The production of low sulphur pig iron from high sulphur purple ores led to tests being made of the feasibility of desulphurizing pig iron in rotary furnaces using lime alone. A large scale test conducted by the Mannesmannröhren Werke resulted in the desulphurization of 56 tons of pig iron from 0.186 to 0.035 per cent S in 117 min., opening new possibilities and leading to further work at Hamborn on rotary furnaces heated with coke oven gas.

Desulphurization was found to take very rapidly in an iron with about 1 per cent S and 1.5 to 2.5 per cent Si, the reduction being from 0.94 to 0.53 per cent in 40 min.; after this there is an abrupt and continuous retardation in the rate of reaction. The original trials

TABLE II  
Effect of Initial Sulphur

Initial Sulphur	Soda Ash added to Pig Iron	Final Sulphur
Per Cent	Per Cent	Per Cent
0.060 to 0.080.	0.323	0.036
Average 0.0685	0.386	0.040
	0.532	0.035
0.080 to 0.100.	0.386	0.041
Average 0.090	0.532	0.045
	0.645	0.0427
0.100 to 0.120.	0.323	0.061
Average 0.106	0.386	0.041
	0.532	0.051
	0.645	0.042
0.120 to remainder.	0.386	0.0556
Average 0.138	0.532	0.058
	0.645	0.062



at Stürzelberg seemed to indicate that satisfactory reducing conditions could not be obtained in a furnace heated with coke oven gas and that desulphurization would, therefore, be inadequate.

This was confirmed in the Hamborn experiments, and led to tar oil being added to create suitable

tion. It is noted that the reaction does not take place at a uniform rate; it may take some time to become initiated, or may start at a high speed and rapidly decay to a slow rate.

Desulphurization can be taken to extremely low values in the rotary furnace, but this requires a long

The lime was finely ground and the air for blowing kept to a minimum. Coal dust could also be added to the lime to give an excess of reducing agent against the oxygen in the blast. On adding 3.5 per cent lime, the S was reduced from 0.12 to 0.065 per cent in 0.75 min., and the Si being reduced from



**TAPPING** a blast furnace at the Bethlehem plant of the Bethlehem Steel Co.

• • •

reducing conditions. Neither this nor other changes in the fuel gave better results and reasonable desulphurization was only obtained by the repeated addition of fresh lime. The furnace was next modified to burn pulverized fuel. The requisite reducing atmosphere was then readily obtained. Desulphurization was very rapid during the first 20 min. when the pig iron came in contact with the fresh lime. In one experiment where 800 kg. lime and 440 lb. fine coke were added to a 5-ton charge, the sulphur was reduced from 0.21 to 0.032 per cent in 1 hr.

These and other experiments indicate that desulphurization with lime in a rotary furnace is a practical proposition, giving desulphurization rates of 0.35 per cent S per hr. with a 6 to 10 per cent lime consumption and the addition of 2 to 3 per cent carbon for reduc-

time. An unexplained feature of this process is the very large amount of iron which is lost. At Hamborn the iron yield was only up to 90 per cent in the experimental plant. It is believed that these losses can be reduced by cutting down the quantity of lime added.

#### Lime Blast Tests

Oelsen has also described the results of laboratory desulphurizing tests using finely ground lime, in which the S was reduced to very low values employing temperatures of 2370 to 2550 deg. F. This led to further tests with an acid-lined ladle which was reconstructed to allow powdered lime to be blown through the charge.

0.47 to 0.4 per cent. The manganese content remained unchanged.

In another experiment an acid iron had the sulphur reduced from 0.32 to 0.069 per cent in three stages at intervals of 1.9 min. The Si came down from 1.69 to 1.44 per cent and the Mn from 0.47 to 0.32 per cent.

No law could be deduced from these first tests. The temperature drop was considerable owing to transferring to the cold ladle and the Mn loss correspondingly high.

If conditions are suitable, desulphurization with manganese by the formation of a sulphide can be extremely efficient. In one experiment Mn was reduced in 2 hr. from 0.49 to 0.29 per cent, while the sulphur was lowered from 0.17 to 0.09 per cent. A high degree of desulphurization which it was thought could only be obtained with soda ash can thus also be obtained with

TABLE III

Test No.	1	2	3	4
	14.30 Geier	14.30 Geier	4.40 Poti	14.30 Geier
Change in Lbs. Ore	4.40	4.40	2.86	6.60
Coke	4.40	8.80		
Lime				
Initial Values, Per Cent				
Si	1.73	1.22	2.22	2.16
Mn	0.24	0.07	0.27	0.32
S	0.38	0.65	0.12	0.34
Reduction, Per Cent, Per Hr.				
Si	1.20	1.04	1.00	1.45
S	0.205	0.415	0.045	0.152
Increase in Mn, Per Cent, Per Hr.	0.52	0.34	0.83	0.43
Yield, Per Cent, Mn	30.5	15.4	53.0	26.5
S Loss, Per Cent				
Absolute	0.24	0.38	0.058	0.19
Relative	63.	59.	48.	56.

comparatively low Mn values. In another case Mn was reduced in 6 hr. from 0.27 to 0.07 per cent and the sulphur from 0.49 to 0.36 per cent. The Mn and the S are hence reduced in roughly the same ratio as the amount of sulphide formed.

In cooperation with the Kaiser Wilhelm Institut für Eisenforschung, Oelsen suggested utilizing the reducing power of Si to liberate Mn from its oxides in the ore and to carry it over to the pig iron. The S occurring as iron sulphide in the

pig iron is then transformed into Mn sulphide and separates out.

#### Pulverized Fuel Used

This was tested in the pulverized fuel heated rotary furnace by (1) preliminary reduction of the ore with carbon, chief purpose of which is to remove the iron from low Mn ores, the rest of the Mn being reduced later by the Si in the pig, and (2) by reducing the ores with silicon alone. The ores used were a Geier ore with 28 per cent Fe, 16

per cent Mn, less than 1 per cent CaO, and 22 per cent  $\text{SiO}_2 + \text{Al}_2\text{O}_3$ , and a Poti ore with under 1 per cent Fe, 52 per cent Mn and 9 per cent  $\text{SiO}_2$ .

A special advantage of the process is that with an acid bessemer charge no Mn need be added to the charge, thus excluding a resulting low yield of Mn. The results of these tests are given in Table III, and show that in tests 1 and 2, Mn reduction was not satisfactory, while the reduction in S was just tolerable. In experiment 3, with Poti ore without preliminary reduction, the Mn reduction was exceptionally good, just as in experiment 4 with Geier ore.

The rates of desulphurization, especially in test 3, with low initial S, were quite small. Against expectation, the reactions took place at a comparatively slow speed. Observations were in the main discontinued after one hour, this period being regarded as the economic limit. The process appears to be quite practical, however, with high S and siliceous pig iron, a rate of desulphurization of 0.4 per cent S per hr. being obtained in some cases. The basicity of the slag does not appear to have a serious influence, as even when the basicity fluctuated in the wide limits the reaction was barely affected.

## "Spatial" Lighting Eliminates Glare

BY a new design, the brightness and glare usually resulting from fluorescent lighting have been eliminated by a recently developed "Spatial" lighting system, in use for the first time in the engineering department of the Fairchild Camera Works, at Jamaica, N. Y. The new lighting design was developed by Ainsworth

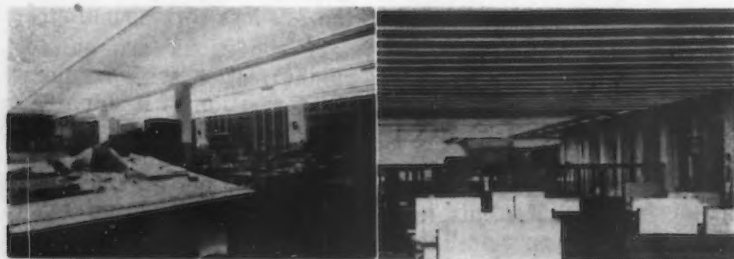
Lighting, Inc., 239 East 44th St., New York.

A new style of steel and plastic chassis is used to hold the fluorescent lamps, weighing  $5\frac{1}{2}$  lb., exclusive of auxiliary coils, and manufactured to hold two 4 ft., fluorescent lamps. This design shows a saving of about 100 per cent in steel over many types of

fluorescent lamp chasses, and carries either a 2-lb. plastic reflector for drafting room illumination or a 5-lb. reflector for factory lighting.

All parts of the chassis are removable for cleaning without disturbing the lighted lamps, and it is made in 8-ft. lengths that lock end-to-end with simple interlocking keys, without the use of screws or bolts. On one three-wire electrical outlet, 96 running feet of fluorescent lighting can be installed. Supports, at 8-ft. intervals, consist of 3/16-in. steel rods, 14 in. long that attach either to toggle bolts in a hung ceiling or to expansion bolts in concrete slabs.

By design, the brightness of the plastic reflectors fades into the ceiling, eliminating the brightness differences that cause glare effects usually present with fluorescent lighting.



OFTEN with fluorescent illumination, lighting as illustrated on the left results, but with the use of "Spatial" lighting, shown at right, illumination is more intense, glare is eliminated, and light is more uniform.



# Aluminum Rotor Casting

**S**TEPPED-UP demand for electric motors has necessitated expansion of the rotor casting department at Reliance Electric & Engineering Co., Cleveland. This department casts rotor bars, short circuiting rings and fan blades as an integral unit to eliminate connections which might otherwise loosen up under severe service conditions.

Laminations for the rotor core are stacked on arbors, assembled into molds and placed in the casting presses. The mold assembly is sometimes preheated to guard against premature chilling and improper filling of the casting.

Two casting presses inject molten aluminum at 1250 to 1420 deg. F. One is a self-contained oil operated unit, the other is pneumatic. While the casting operation requires but a few seconds, pressure is maintained on the mold for a period long enough to permit chilling of the metal and to allow fumes to be exhausted by the blowers mounted on each unit.

After the mold has been stripped from the casting in an arbor press on an adjacent bench the casting is placed in a key-seater. Here, in what is essentially a broaching operation, a cutter with a multiple set of teeth cuts to final dimensions the keyway for the motor shaft.

Directly above the two casting presses is an exhaust fan with a capacity of 10,000 cu. ft. of air per min. In combination with two 1½ hp. exhaust fans on the side walls it provides for changing the air in the shop as often as three times a minute if necessary. To minimize noise and vibration, the side wall fans are mounted on channels which extend from the floor to the ceiling. They discharge through steel shuttered apertures in the side wall. A separate vent line and motor driven exhaust blower serve the preheating oven.

The two aluminum melting pots which serve the presses are well in-



**D**IE casting presses produce rotor bars, short circuiting rings and fan blades as an integral unit to eliminate connections which might loosen up under severe service.



**K**EY-SEATER, left, which broaches keyways in rotor castings. The operator at right is assembling rotor core laminations on an arbor. Each die casting press is fitted with safety hood and exhaust fan.

sulated with specially designed covers which can readily be removed to give access to the furnaces. Two-inch thick insulation is used on the sides of the enclosures with 4 in. of insulation in the tops. The latter are made in two sections to minimize exposure of the hot metal when it is necessary to add ingots, skim off slag or insert pyrometer rods. To reduce heat loss from the ladles when the covers are closed, the latter are equipped with spring seals and are motor operated so that their opening and closing ac-

tions will be positive. The furnaces are set slightly off center beneath the ladles to permit skimming slag off over the side and down into furnace pans below.

Two overhead, one-ton, chain pull hoists travel the length of the shop and provide complete coverage of the entire area of the casting room. Care has been taken to arrange the equipment in the room to leave sufficient space around all machinery to provide room for skids bearing incoming material and outgoing finished parts.





**PLASTER** molds and their patterns. Metal patterns are shown on top, with the drag at the left and cope to the right. Their matching green molds are shown below them, with a sample casting. Dark areas in the drag section of the mold are metal cores which form the slot in the casting. This slot is held to 0.001 in. tolerance without difficulty.

**T**HE constant aim of foundrymen throughout the years has been to develop methods of casting production which will give precise reproduction of pattern detail and which will permit working to very close dimensions so as to reduce, if not completely eliminate, machining operations.

One of the more recent steps in that direction has been the use of plaster mixtures for molds on a production basis. Research and development work carried on by Morris Bean of the Antioch Foundry, Delco-Remy Division of General Motors Corp., has greatly extended the knowledge of the characteristics of plaster molds. Bean has also been able to develop methods\* of controlling these character-

\* See U. S. patent 2,220,703, Nov. 5, 1940 issued to M. Bean.

istics to remove some of the obstacles which have in past years deterred the use of plaster as a mold mixture.

Use of plaster molds, according to Bean's specifications, provides a medium especially well adapted for casting large, highly stressed parts of aluminum to close tolerances.

In addition to a G-M plant, the foundry division of Menasco Mfg. Co., operating under a G-M license,

is also employing the Antioch process on a substantial basis to produce a wide variety of aluminum castings.

Generally speaking, an ideal molding medium must have easily controlled shrinkage or expansion characteristics (ideal, of course, would be a medium devoid of either shrinkage or expansion), high permeability, a fine surface texture, high green strength, but low strength after pouring and a controllable thermal conductivity factor.

So far as plaster molds are concerned, the difficulty in the past has been to develop mixtures and processing techniques which would give all these features. Many methods have several but none has all these features. This requires a constant juggling of qualities to suit each individual casting job.

As an example, it is possible by simply driving off the water of crystallization and permitting complete dehydration, to obtain a mold investment that will record the finest detail and will have little shrinkage on small molds. Yet this material has too great a shrinkage to permit its use for large castings and its low thermal conductivity prevents its use for casting heat treatable aluminum alloys which require rapid freezing.

Menasco reports that their experience with the Antioch process has indicated that Bean has developed a material that limits expansion to a uniform amount of about

# Precision A

By R. RAYMOND KAY  
Southern California Editor  
THE IRON AGE

0.001 in. per in. of length. The mixes required to suit the characteristics of the various metals and types of castings produced at Menasco have practically uniform qualities as to permeability, tensile strength and compressive strength. It is possible very economically to produce heat treatable castings which require rapid freezing.

At the Menasco plant, aluminum alloys No. 195, 355, 356, and heat treated T4 or T6 are being produced. Castings of No. 214 and No. 43 are being furnished as cast. Alloys No. 12, 40, 108, and 112 can be cast, but thus far there has been very little call for this group in the area supplied by this plant. Alloy No. 220 (high Mg), it is asserted, cannot be cast economically.

The average weight of castings produced at Menasco is about 1/2 lb. and are of such a size that a 10 x 12 in. flask will hold four castings. Flasks of various sizes are used as required to fit specific jobs. The smallest casting produced there weighed about 1/3 oz., while the largest was 350 lb. This latter casting was 4 ft. long, with metal thickness varying from 1/2 in. to 4 in. Actually, there is no limit to the weight of castings that can be made by the Antioch process, other than the practical limitations of handling and drying the mold sections.

The Menasco foundry has been working with this process on job orders for over a year and a half to ascertain the economic possibilities of the process and to develop techniques for heavy production.

The average production of the plaster foundry at Menasco has been about 400 molds a day, or approximately 800 lb. of metal. A great deal of research work has been done in attempting to appraise the maximum accomplish-

# Aluminum Castings . . .

ments possible with the Antioch process as compared with sand castings. This study has been possible by the fact that Menasco operates a sand foundry as well as a plaster foundry.

The two chief disadvantages of Antioch castings found in the commercial jobbing field, according to Menasco, are the present comparatively high cost per pound (com-

*For a description of another plaster mold procedure, the Capaco process, see THE IRON AGE, Oct. 9, 1941, p. 74.*

pared with sand castings) and the length of time required to tool up the foundry with the precision patterns required to obtain the full benefit of the process.

As far as the cost per pound is concerned, this is being overcome by educating casting buyers to think on the basis of the final cost of the casting in the assembly, rather than the foundry cost. In other words, the savings in machining and the design possibilities of Antioch castings must be calculated against the foundry cost of the casting.

**. . . Use of the Antioch plaster mold process for the production of highly stressed aluminum castings to unusually close tolerances is described herein for the first time.**

The foundry tooling up process for Antioch castings requires some four to five weeks. This time includes the development of patterns, casting pilot pieces and the checking of production technique. However, after production methods are established, the molds can be turned out at the rate of four an hour from one cope and drag pattern. A highly complicated mold consisting of several large sections moves more slowly, of course, and may require as much as an hour for molding.

The heart of any casting, regardless of how it is produced, is the pattern. This is especially true with plaster molds. Too often casting buyers want good castings from bad patterns. To correct this situation, Menasco has established its own pattern shop to fulfill the precise pattern requirements of the Antioch process.

Antioch patterns follow the general design of sand patterns whenever possible. The employment of metal patterns, metal match plates and metal cope and drag plates are essential. The chief differences, however, lie in the ultra precise dimensions which are established. Shrinkage allowances on Antioch patterns are the same as for sand.

In cases of a complicated pattern which can be made economically only by using a wood model, U. S. Gypsum's non-expanding Hydrocal is used to advantage. A master mold is cast around the model and reverses of its various sections are then made. Such temporary patterns, augmented by Cerromatrix or aluminum strips on parts exposed to chipping or abrasion, are good for runs of about 500 castings.

Protective coatings are available to enable wood patterns to withstand the moisture of the plaster

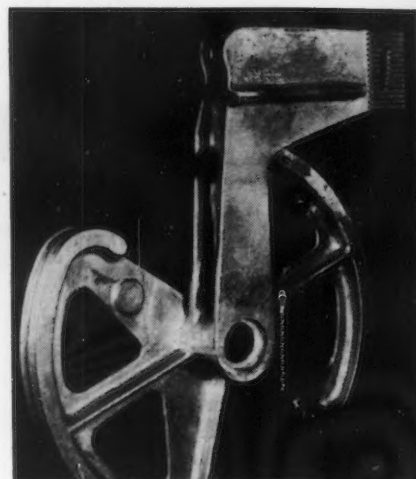
**FIG. 1—**Typical Menasco plaster mold aluminum castings. In the center of the bottom row can be seen a super-charger impeller. This is a highly stressed piece, but has a wall thickness of only 1/16 in. Note on the lower right a thin-walled casting with several re-entry curves and varied wall thickness. The heavy-walled center casting is a hydraulic application. The generally thin walls of these pieces is especially noteworthy.







LEFT  
**FIG. 2**—This non-stressed casting was formerly made of welded sheet steel. It has a wall thickness of 1/16 in., weighs 5 oz. and is a good example of the application of this process.



RIGHT  
**FIG. 3**—This heat treated aluminum casting weighs 3 1/4 lb.

mix so that about 50 molds may be made from a good wood pattern.

Where close tolerances are not vital, a thermo-plastic rubbery material known as Korogel is occasionally used to advantage to simplify pattern design, especially where undercuts are involved.

#### Draft Requirements

While it is possible to work with unusually small draft, standard practice is to allow about 0.004 in. for the first inch, per side, to simplify production. After the first inch, a draft of 0.002 in. is possible. On some pieces having one angular wall, a draft angle of 30 min. may be readily cast without the use of cores. Web thicknesses which can be accommodated on a production

scale are dependent upon casting size and shape. Wall thicknesses of 1/8 in. can be kept within 1/64 in.; 3/32 in. wall areas can be cast in sections 8 x 10 in., while 1/16 in. walls have been cast in areas 4 in. square.

Non-heat treated rings 30 to 60 in. in diameter and weighing 350 lb. have been cast to diametrical tolerances of  $-0.001$ ,  $+0.010$  in. Normally, an overall tolerance of  $\pm 0.015$  is not difficult, and a tolerance of 0.01 in. 5 in. is practical. Dimensions lying within the same half of a mold or within the same core can be held to tolerances of  $\pm 0.003$ .

The Antioch process is especially adaptable where complicated coring problems exist, where compound

curves are required for contact with other smooth surfaces and where reduction of weight in stressed parts is important.

#### Investment Composition

The investment is mixed in accordance with the casting requirements, the density of the mix having a controllable effect upon the thermal characteristics of the mold. The proportion of the various materials is also varied. A typical mixture is 40 parts of calcined gypsum, 60 parts of silica sand, with a small amount of fibrous talc added to accelerate the formation of granules in the recrystallization process. To this dry mixture, water is added, the average amount being about 58 parts of water to 100 parts of dry

**F**ITTING in gates, runners and risers into cope and drag patterns after locations have been determined by pilot castings and X-ray studies.



**P**OURING the plaster investment. This mixture is allowed to set for about 10 min., following which the mold is stripped. Prints and alining pins are used in setting the cores.





mix. The technique of mixing and handling plaster is well known to the ceramic industry and the dental profession and these established procedures are used by Menasco.

The accelerator addition can be such material as particles of set plaster, epsom salts, potassium citrate, etc. Various patented mixtures are also available that will prevent expansion during setting.

The patterns are surmounted with a flask and the liquid mixture poured in. The molds are set on racks and wheeled into autoclaves where they remain for about 9 hr. Steam at 15 lb. pressure and 260 deg. F., is employed in this treatment.

Leaving the oven, the molds are permitted to reset in the air and it is in this period that a granular structure develops within the mold. Roughly 10 hr. are required for this resetting.

Following this treatment, excess water is removed from the molds by drying in ovens where air at 350 deg. F. is circulated around them. This drying operation takes from 8 to 48 hr., depending upon the mold section. After cooling to room temperature, the metal is poured into the molds by gravity.

#### Mold Permeability

The treatment given these molds makes it possible for an unused mold to stand several days without any important change in moisture



**FIG. 4**—The application of this casting requires unusually close tolerances. It is cast of a heat treated alloy, weighs 4 lb. and is 24 in. long.

content. The finished molds have a permeability of 40 A.F.A., with a tensile strength of 20 lb. per sq. in. Chills can be used as in sand casting.

Sufficient time has not elapsed to permit a dogmatic statement of the economic position of Antioch process castings, Menasco feels. At the present time the cost of these castings is between 2 and 3 times greater than comparable sand units, in the as-cast condition.

This spread, however, is counterbalanced by the greater accuracies and more complicated castings that can be produced in plaster molds. The elimination of machining is

*While this article was in preparation, the foundry division of the Menasco Mfg. Co. was sold to the R. H. Osbrink Mfg. Co. This latter company will continue to produce Ant'och process castings along the lines developed by Menasco.*

valuable not only for the reduction in overall casting costs, but also in shortening processing time. As experience is gained, substantial reductions in present costs are reasonably expected.

A discussion of the means of obtaining the characteristics of the plaster mold, which are the heart of the process, may be interesting at this time. The desired character-

### Castings at the Menasco Foundry

**D**RYING the molds. Gates and risers are sealed during processing to keep out foreign matter. This operation takes from 8 to 48 hr., depending on mold size.



**P**OURING plaster molds. No pressure is used for this operation, all pouring being done by gravity. In the right background can be seen the match plate flasks.

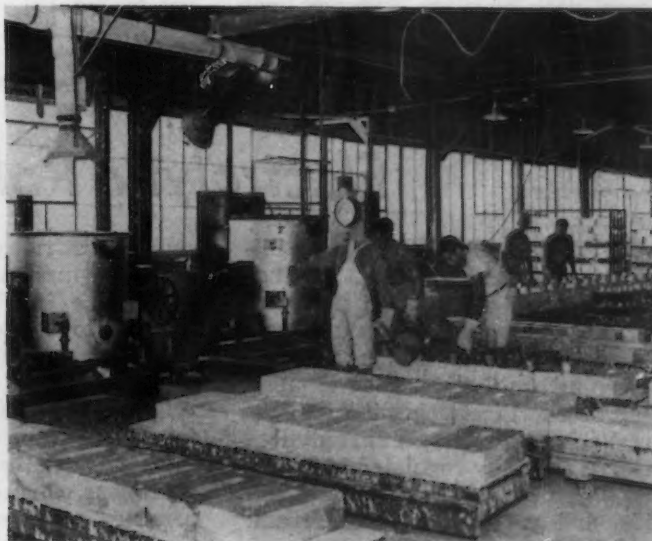




FIG. 6—These macrographs show plaster mold investment at various stages. Left view shows the surface (16 diameters) of a mold before processing and drying. The fine dots are sand grains visible through the surface film. The light horizontal lines are surface scratches due to pattern imperfections. Center (16 diameters) is the interior structure after processing and drying. White areas are granules containing one or more grains of silica sand. The dark areas are voids. Right shows the surface after a casting has been poured against it. Note that the surface is still smooth and unbroken.

istics are achieved, fundamentally, by a treatment where a re-crystallization process occurs within the plaster mixture. This is accompanied by a growth of the larger crystal grains at the expense of the smaller.

Thus, a mold is produced which is composed of a thin, porous, fine-grained surface layer, backed by a body of larger granules. The plaster, when the mold is poured, still contains most of its water of crystallization so that, as the molten metal runs over the surface, the endothermic action of the dehydration aids in chilling the metal.

This recrystallization phenomenon is effected, first, by a controlled heat treatment for uniform conversion of the calcium sulphate dihydrate of the mold to the hemihydrate condition; second, an automatic saturation of the body of the mold with moisture sufficient, not

only to reconvert the calcium sulphate to a di-hydrate, but to provide excess water at the interfaces at which the recrystallization can occur; third, the maintenance of such conditions favorable to the recrystallization until the desired redistribution into larger grains has occurred, and, finally, the termination of such conditions by drying.

The most practical and satisfactory method of obtaining the desired uniform dehydration is to subject the entire mold to an atmosphere of slightly super-heated steam in an autoclave at a temperature sufficient to effect the desired dehydration.

The autoclave treatment is regulated so that approximately  $\frac{3}{4}$  of the water of crystallization of the gypsum plaster is liberated—i. e., the di-hydrate is converted to hemihydrate—but the liberated water is not evaporated because the treat-

ment takes place in an atmosphere saturated with water vapor.

Upon the release of pressure from the autoclave, the mold is wet through and recrystallization of the calcium sulphate to di-hydrate begins immediately. The free water is drawn away from the surface toward the interior by capillary action, so that the granular structure stops just short of the surface as the mold resets.

Use of plaster mixes in the past has been restricted because of the excessive and variable shrinkage upon their required complete dehydration; their very low strength after this dehydration, and their low heat capacity. The treatment described in this article overcomes these objections and provides a means of controlling all the characteristics desired in a mold, according to Menasco officials.

## Electrolytic Polishing of Silver

INVESTIGATIONS by L. I. Gilbertson and Otis M. Fortner covering the electrolytic polishing of silver by a process of anodic corrosion are described in a paper given before the 81st general meeting of the Electrochemical Society at Nashville, Tenn. If current density is carefully regulated in a bath of silver cyanide, potassium cyanide, and potassium carbonate and room temperature in the bath and

sufficient stirring to prevent layer formation are maintained, the reflectivity of the resulting surface appears to be as high as, if not higher than, that of a mechanically polished surface.

The process depends upon the formation of an anode film that is soluble in the bath under suitable conditions of current density, temperature and free cyanide concentration. The method of polishing

affords a means of preparing silver specimens for etching and microscopic examination without introducing any possibility of a mechanically work-altered surface layer. Etching may be carried out on the polished surface in the usual manners, either by the use of a corrosive agent such as chromic acid, or by making the specimen anodic in a cyanide plating bath and etching at a low current density.



**M**OUNTING demands for magnesium for war purposes continue to emphasize interest in new processes for its production. According to D. H. Killeffer, in a recent issue of *Chemical and Metallurgical News*, the latest of these employs ferrosilicon to reduce calcined dolomite to free metallic magnesium which is then distilled from the reacting mass. Production of the light metal in the United States has so far been limited to the electrolysis of magnesium chloride obtained from natural brines and from sea water together with small amounts from the Hansgirg process based on the reduction of calcined magnesite with carbon.

A new ferrosilicon process has been developed by L. M. Pidgeon, of the Canadian National Research Council. Pidgeon found that the reaction between ferrosilicon and magnesium oxide proceeds smoothly at practicable temperatures under vacuum in the presence of calcium oxide. Metallic magnesium distills readily at the reaction temperature and condenses in extraordinary purity as a crystalline lining in a condenser tube connected with the reaction retort.

The process consists of briquetting ground ferrosilicon (75 per cent or higher silicon content is preferred) with dead burnt dolomite and heating these briquets in an alloy steel retort to about 1150 deg. C. (2102 deg. F.). The retort is constructed with an integral condenser tube into which a removable, tubular steel lining fits. The retort and condenser are evacuated to low pressure (a fraction of a millimeter), and as the reaction proceeds, pure metallic magnesium condenses in the lining of the condenser. At the end of the run—including time for evacuation, the cycle is about 6 hr.—the condenser liner is removed with its accumulated magnesium. Differential contraction of the steel and magnesium breaks the two apart and the magnesium "pipe" is ready to go to the foundry without further purification or treatment. The retorts used

## Magnesium from Dolomite

o o o

resemble those of the zinc industry and can be heated in any convenient manner, using gas, coal or electric heat.

The advantages claimed for this process are several. The process equipment is comparatively simple: cast alloy steel retorts which embody a minimum of machine finishing, furnaces for heating the retorts, and vacuum pumps to evacuate them. Dolomite is plentiful and easily calcined in standard lime-kiln equipment. Ferrosilicon is made in this country on a huge scale in standard electric furnace equipment from plentiful raw materials. The reaction proceeds smoothly without hazard. No evolution or handling of gases is involved, and when the retorts are opened, the magnesium is in solid massive form precluding the possibility of explosion or fire. Special emphasis is placed on the relatively low investment in plant required and on the speed with which units can be built in the present emergency. Furthermore, pilot plant operation to date has amply proved the process, and construction of production plants is already under way.

Several companies have become actively interested in putting this process to work. In Canada, Dominion Magnesium, Ltd., is operating a pilot-scale plant. This operation is in process of being enlarged to 10 tons per day. The process depends on the simple reaction between magnesium oxide and elementary silicon contained in ferrosilicon:



Subsequent reaction between the

$\text{SiO}_2$  formed and the calcium oxide of the charge forms infusible dicalcium silicate that can be easily removed from the retort at the end of the run without slagging. No gas is evolved or involved in the process. Based on this reaction, each pound of silicon in the charge should theoretically produce 1.73 lb. of metallic magnesium. In terms of 75 per cent ferrosilicon, each pound of magnesium produced requires practically 1 lb. of alloy.

The simplicity of the operation depends further on the fact that a powerful reducing agent, ferrosilicon, is supplied to the process. This must be manufactured elsewhere, and although the raw materials required for it are plentiful, the energy needed is high and the demand for the product by the steel industry is great. Production of ferrosilicon of all grades in the United States in 1940 was 406,699 net tons. The average silicon content of this entire output was 28 per cent. Included in the total are alloys containing as little as 7 per cent and as much as 95 per cent elementary silicon. The lower grades were produced in blast furnaces whose total output was 190,310 tons. Electric furnace operation supplied 219,141 tons of higher concentration alloys and 248 tons were produced as a by-product of electric furnace abrasives. Present rate of production is over 700,000 tons per annum.

Because of the need for ferrosilicon in war work, the present fixed price ceiling for the 75 per cent grade is \$135 per net ton. On this basis and assuming that ferrosilicon of the required grade is available in sufficient quantity, the cost of magnesium by the Pidgeon process should be well below the present market price of 22.5c. per lb.

When these facts are considered with the obvious advantages of the process and the further consideration that the operation can be carried out in relatively small and widely distributed units, the desirability of utilizing ferrosilicon as a reducing agent with dolomite in the expanded magnesium program at once becomes patent.

## Super-Quench a New Oil

**A** NEW quenching oil—Super Quench—that is said to have a faster cooling rate than any other known quenching oil, has been developed by Gulf Oil Corp., Pittsburgh. It is claimed that it has a

cooling rate intermediate between oil and water through the hardening temperature range, and it retains the slow speed of oil below this range.

Developed after extensive re-

search, the new quenching oil makes possible maximum physical properties, but institutes no more distortion than do ordinary oils. It has been proved by service on many types of steels and various shapes.



# Rapid Steel A

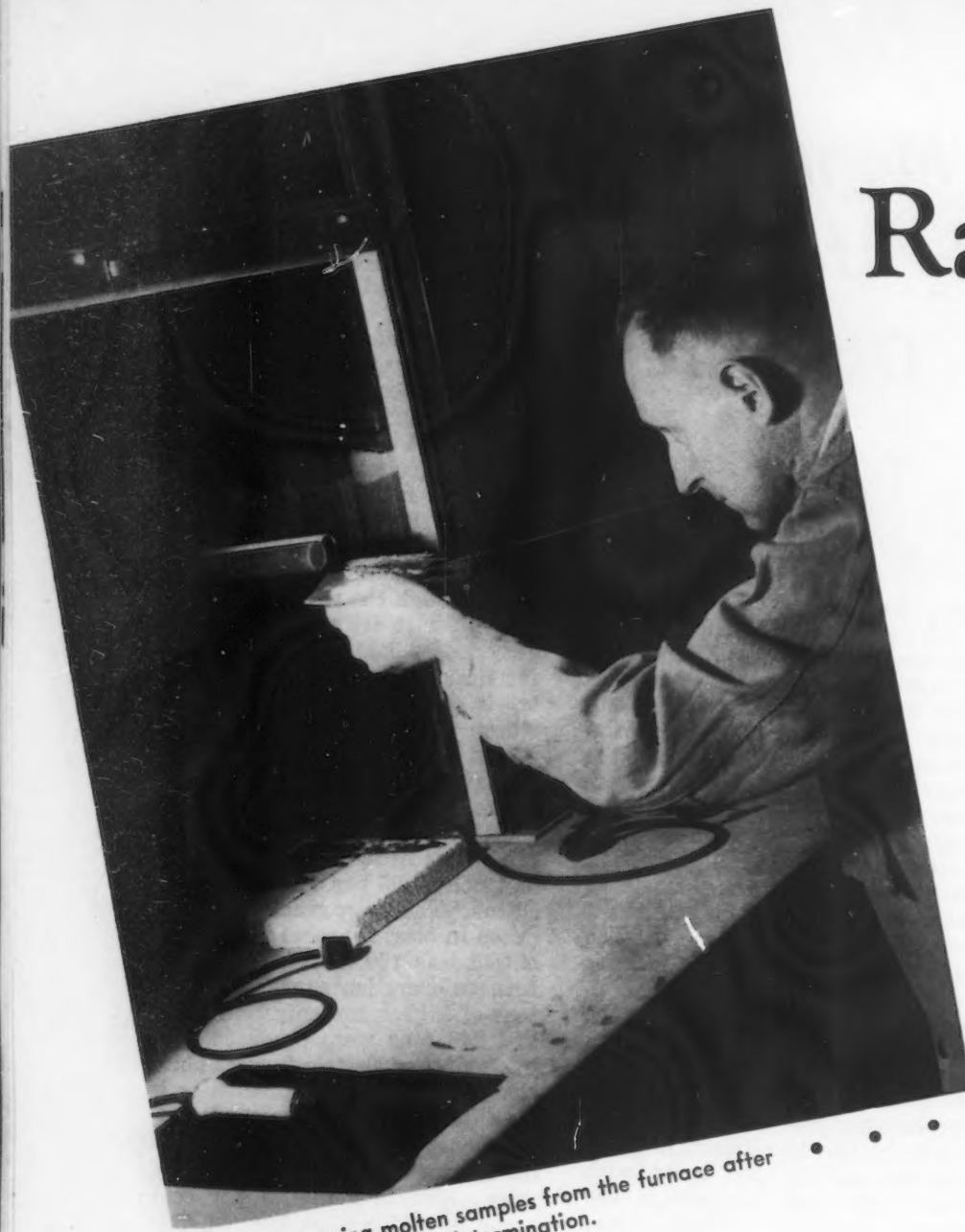


FIG. 1—Drawing molten samples from the furnace after carbon determination.

**A**NALYSES of heats poured at the steel foundry of the General Electric Co. at the Schenectady Works are carried out on a 24-hr. basis, with 72 quantitative analyses being routine practice with a two-man staff, one man at a time being on duty.

While the foundry's normal six melts each 24 hr. calls for 72 analyses, this number can easily be increased to around 100 under existing operating conditions in the new laboratory. Indeed, with a no longer used short cut method, involving less weighing due to the use of quickly measured portions for different analyses, 145 determinations

have been performed during a 24-hr. period. The laboratory operating staff consists of Mr. Gerald Zeh, in charge, and Mr. N. I. Sax.

For each of the usual six heats run in the foundry each day, four preliminary analyses are made—duplicate carbon, a manganese and a molybdenum determination. These are made to ascertain the amount of these constituents present in the steel being melted. Based on these findings, the composition of the melt is altered until the desirable amounts are present for the type of metal wanted. From another sample, made after addition of various materials to the melt, the final analyses are made for eight constituents, which include two more carbon determinations.

Since the preliminary analysis and the final carbon analyses con-

stitute half of the tests made, it is of interest to see how the four preliminary analyses are carried out in less than half an hour. No claim is made that the methods used are new or original, but convenient placing of apparatus has resulted in the speed with which results are turned out.

## Carbon Determinations

For carbon determinations, a 1.3636-gm. sample of steel, or one of half this weight for cast iron, is placed on aluminum oxide (Aluminox) in a nickel boat set in a quartz tube running through an electric furnace at about 1470 deg. F. Purified oxygen is made by passing tank oxygen, by way of a reducing valve, through sulphuric acid-chromic acid mixture, then dehydrate (magnesium perchlorate, tri-hydrate) and finally Ascarite (sodium hydrate-asbestos). This is passed over the metal to remove carbon by forming carbon dioxide.

The exit gas is taken through the first two reagents, emerging as oxygen and carbon dioxide, both dry. It then enters a weighed (counterpoised) drying tube containing more dehydrite and then Ascarite. The latter picks up the carbon dioxide, the amount being determined by re-weighing.

## Molybdenum

Molybdenum is determined by the colorimetric method. Sometimes special steps are necessary for special samples, but the usual procedure is as follows:

(1) Weigh 1/10\* gm. into a 125-milliliter Erlenmeyer flask. Add 10 c.c. of 72 per cent (asbestos filtered)

\* One gram samples are used for molybdenum below 0.10 per cent, with smaller samples for higher percentages.

technical perchloric acid. Heat beyond the appearance of dense fumes to the point where the fumes have retreated until they seem only to hover over the flask mouth. Cool

# Analysis

By DR. ALBERT C. TITUS  
*Schenectady Works Laboratory,  
General Electric Co.*

slightly and add 30 c.c. of water, then complete cooling.

(2) Add 10 c.c. of 5 per cent NaSCN. Shake, add 25 c.c. of 11.2 per cent  $\text{SnCl}_2$  (containing 10 per cent of concentrated HCl) and shake. The orange color of the molybdous thiocyanate shows when the red color from iron has been destroyed.

(3) Transfer to a 250 c.c. separatory funnel and add 20 c.c. of

*\*\* Technical grade butyl acetate is saturated with NaSCN, then with  $\text{SnCl}_2$ , using excess of these solutions and each time utilizing a separatory funnel. Repeat this if necessary to dilute the material.*

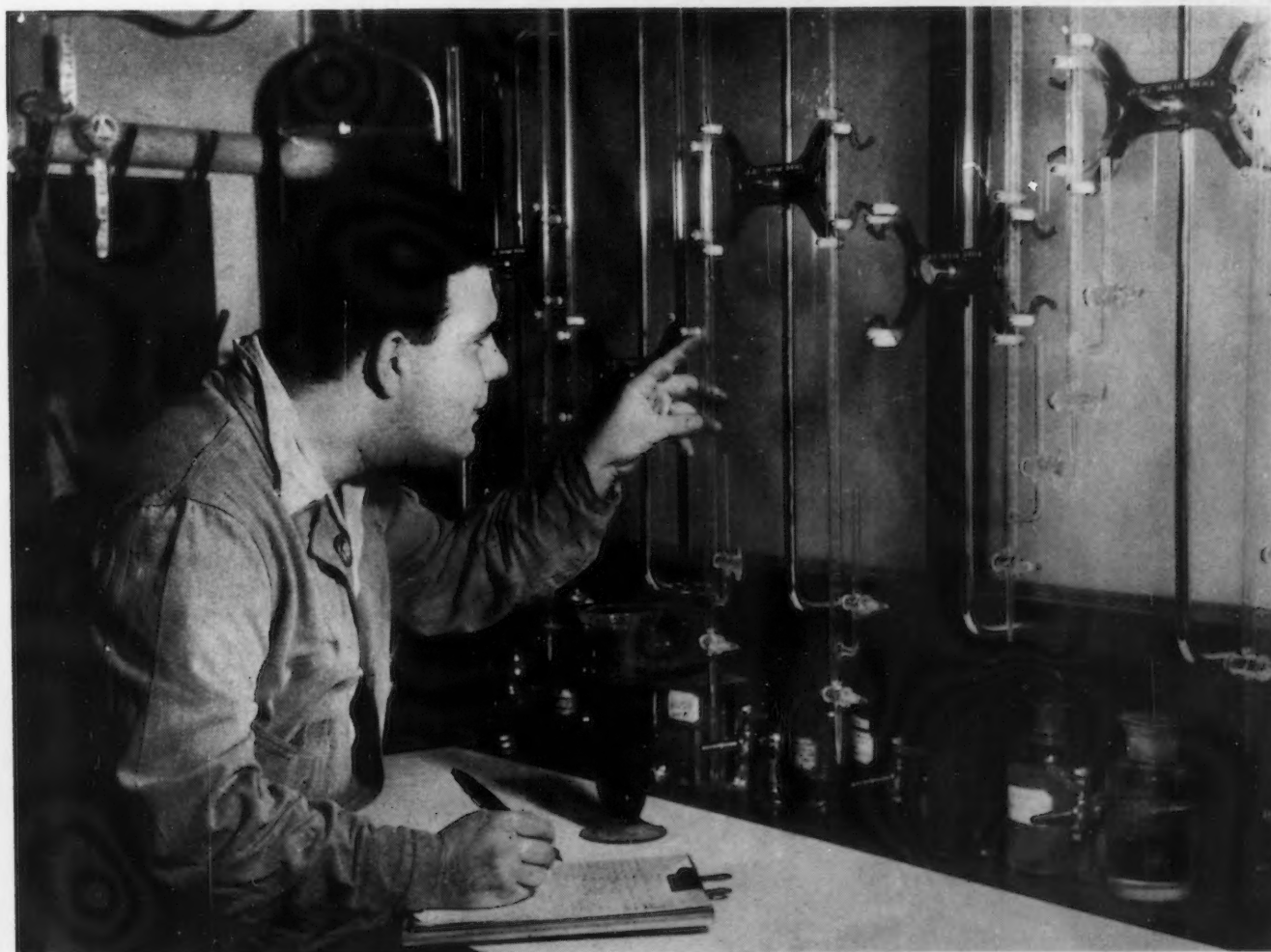
**... The technique employed in the new G-E steel foundry laboratory to obtain up to 100 routine quantitative analyses in a 24-hr. period with a two-man staff is described herein.**

treated\*\* butyl acetate from a burette. Add 10 c.c. of NaSCN and 25 c.c. of the  $\text{SnCl}_2$ . Shake, then separate, keeping the upper layer. Let it stand. Again drain off the lower

layer. Run the orange-colored butyl acetate solution into a 6-in. test tube.

(4) Six-inch test tubes contain the standards. They are permanent

**FIG. 2—**Titration table in the new G-E steel foundry laboratory. The background is fluorescent lighted.





for a few weeks, being closed with corks covered with red sealing wax. They are arranged in steps of such size as to represent changes of 0.03 per cent molybdenum in a 1-gm. sample of unknown; 1 c.c. of the molybdenum standard solution contains enough to change the standard by this amount.

This standard solution is made by dissolving 4.35 gm. of Bureau of Standards No. 107 (0.69 per cent Mo) steel, using 75 c.c. of 70 per cent  $\text{HClO}_4$  and sufficient C.P. 48 per cent  $\text{H}_2\text{F}_2$  to destroy the silica. Fume, cool, add 250 c.c. of hot water, boil off chlorine. Filter graphite out and make to 1 liter with 30 per cent  $\text{HClO}_4$ . In making the standards from this solution, use a whole number of cubic centimeters of the latter. Add 30 per

cent  $\text{HClO}_4$  to make 30 c.c. total volume. Seal as previously described.

#### Manganese

In determining manganese, a 1-gm. sample is used if less than 1.50 per cent Mn. is present. The sample is dissolved in 30 c.c. of an acid mixture made by mixing:

$\text{H}_2\text{O}$  . . . 1050 c.c.  
concentrated  $\text{H}_2\text{SO}_4$  . . . 200 c.c.  
concentrated  $\text{H}_3\text{PO}_4$  . . . 250 c.c.  
concentrated  $\text{HNO}_3$  . . . 500 c.c.

For pig iron, 50 c.c. of the acid mixture should be used.

When in solution, add 100 c.c. of cold water, 10 c.c. of 8 per cent  $\text{AgNO}_3$ , and 10 c.c. of 25 per cent ammonium persulphate. Boil half a minute, cool, titrate with standard sodium arsenite (7.6 gm. per 2 liters, standardized against Bureau

of Standards steel); 1 c.c. sodium arsenite is equivalent to 0.001 gm. Mn.

These preliminary quantitative analyses can be furnished the foundry within a half hour of receipt of the sample at the laboratory. The titration table, Fig. 2, is placed in front of a daylight-fluorescent screen to facilitate color comparisons and burette scale readings.

Balances accurate to 0.00003 oz. and capable of giving indirect readings to within 0.000003 oz. are also available. These balances are mounted on a slate-covered, vibration-proof concrete pier separated from the buildings. This pier is sunk 4 ft. into the ground into the center of the laboratory and is surrounded by cork board that serves as a shock absorber.

## New Magnesium Dust Collector

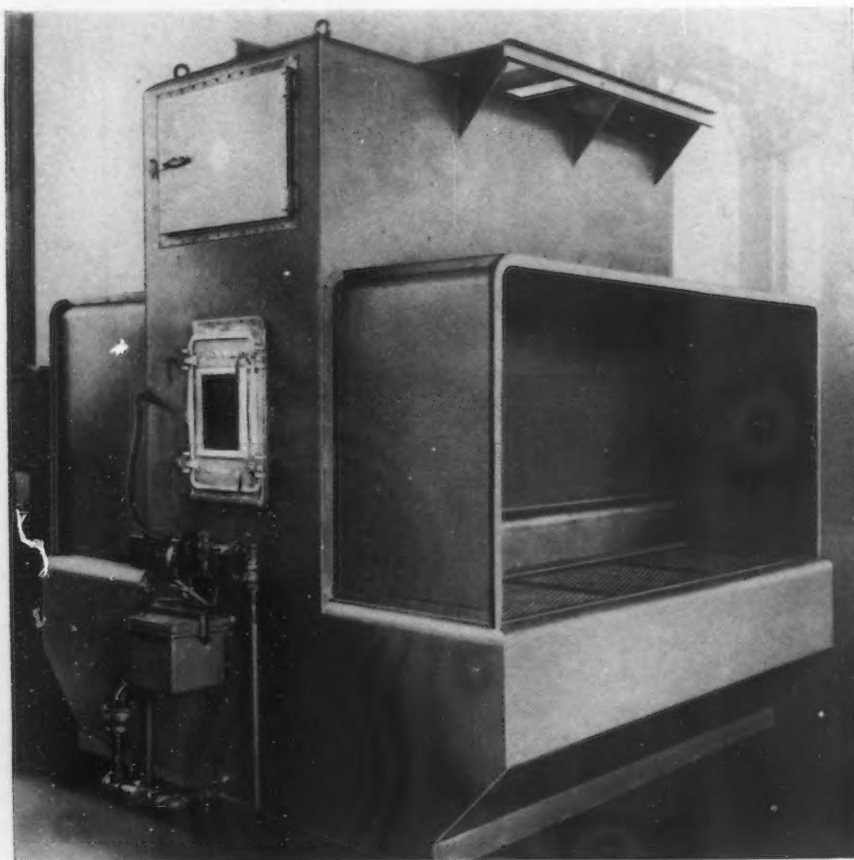
A NEW self-contained magnesium dust and chip collector has been developed by the R. C. Mahon Co., Detroit, which utilizes a three-stage treatment to provide complete

wetting of the dust and chips. This unit, called the Hydro-Foam collector, is shown in the accompanying illustration. It consists of a bench and hood and the collecting and

wetting equipment. The collector is portable and is available in single or double units, the latter permitting two operators to work at one machine.

A tank, forming the base of the unit, is filled with water and kept at a constant level. A small supply of water is needed occasionally to compensate for evaporation losses. The side extension of this tank forms a bench, which is covered by a wooden grill through which the dust is drawn on to the surface of the water directly beneath. In this, the first stage of dust elimination, the larger chips and coarse particles settle by gravity to the bottom of the tank.

The air, still carrying a considerable volume of the dust, is then forced downward at high velocity against the water in the tank. This second stage forces the bulk of the remaining dust into the water. The impinging action of this operation aerates the water solution and creates a bed of spray. Only the finest particles remain in the air currents passing up and through this spray, where these particles are wetted and retained in this, the third and final stage of the dust removal. The only moving part in this unit is the motor driven fan.

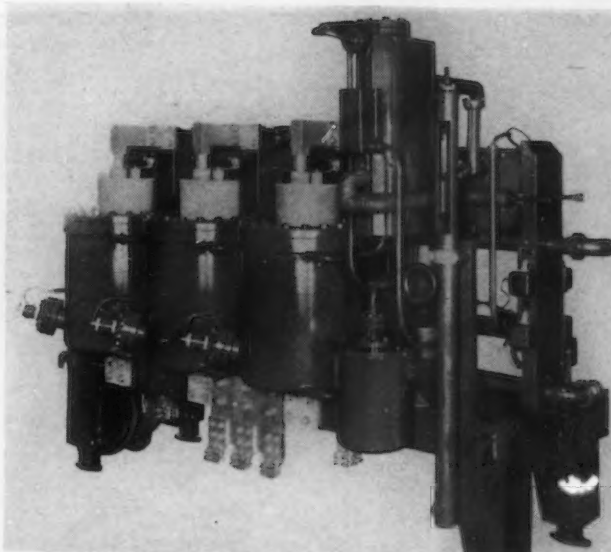


# Steel Mill

## Applications of Rectifiers

By M. J. LEDING

Industrial Engineering Department,  
General Electric Co., Schenectady



THIS General Electric mercury arc rectifier for steel mill service has a rated capacity of 1000 kw. for producing 250-volt d.c. It is in use to supply auxiliary power in the hot mill of one of the nation's wide strip mills.

THE General Electric Co. today has a capacity of 4000 kw. of ignitron rectifiers installed in steel mills, and an additional 5500 kw. are being installed or are on order. These latter are all in 1000 and 1500-kw. units. Until two years ago, the only rectifiers in use in steel mills were two 1000-kw. units producing 250-volt d.c. auxiliary power.

The ignitron rectifier, consisting of a number of anodes each in its individual tank as shown in Fig. 1, proved itself as early as 1938 in the transportation industry at 600 volts. Steel mill operators soon discovered that the ignitron rectifier offered several advantages when compared to conventional motor-generator sets for producing 250-volt d.c. auxiliary power. On comparison of loss curves, there is almost a constant difference in favor of rectifiers in conversions losses over the range of  $\frac{1}{4}$  to  $1\frac{1}{4}$  load.

A typical set of curves is shown in Fig. 2, applying to a 1500-kw. rectifier converting 6600-volt, three-phase, 60-cycle power to 250-volt d.c. power. The losses of the transformer supplying the motor generator set are included. The difference of about 60 kw., when evaluated on the basis of continuous operation which is usual in steel mill practice, amounts to 525,000 kw-hr., or on the basis of five mill power there is a \$2600 a year saving.

A 12 anode rectifier assembly has no moving parts, weighs about 17,500 lb., and requires no heavy foundations. The necessary transformer weighs some 40,000 lb., but this again is static weight. A comparable motor-generator set weighs about 70,000 lb., and requires firm foundations because of the rotating parts.

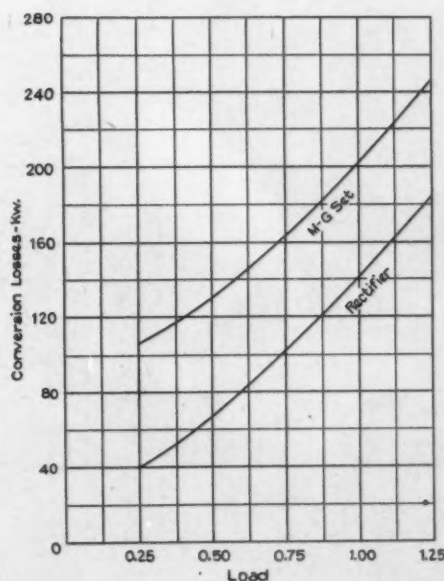
More floor space, if all equipment is on the same floor level, is required by rectifier equipment than by a motor-generator set. This objection is often overcome, however, by locating the rectifier transformer outside of the plant or in the basement beneath the rectifier in the space that would be occupied by motor-generator foundations.

Ignitron rectifiers are simply cooled. The motor-generator, however, must be supplied with sufficient clean air for cooling purposes, and this usually requires ventilating equipment.

Maintenance of the rectifier equipment is low, being confined to pump care. Estimates indicate that rectifier maintenance will cost less than 65 per cent of motor-generator set maintenance. The development of static, tubeless excitation equipment has reduced this cost by eliminating the glass firing tubes in rectifiers.

Services records compiled from 180,000-kw. capacity installed in the transportation and electrochemical fields indicate that ignitron rectifiers are as reliable as motor-generator sets. In a hot strip mill installation two 3500-kw., 600-volt rectifiers are being used in conjunction with an existing 9000-kw. motor-generator. As inherent reliability increases faster than the inverse ratio of the d.c. voltage, it was decided that if 600-volt rectifiers would handle the hot mill main drive, the auxiliary power supply could be entrusted to 250-volt rectifiers.

The most important disadvantage to the use of ignitron rectifiers is the higher initial price. Where primary a.c. voltage is of the order of 23,000 volts and a separate transformer is used with the motor-generator set, rectifier equipment may be comparable in price. Usually, however, a.c. voltages range from 4600 to 13,000, in which case rectifier equipment costs run about 10 to 15 per cent higher than motor-generator equipment with reduced voltage starting and ventilating equipment. Installed costs, however, put the rectifier in a more favorable position.



ON comparison of conversion losses, there is almost a constant difference of about 60 kw., favoring the use of the rectifier over motor-generator equipment over the range of  $\frac{1}{4}$  to  $1\frac{1}{4}$  load.





# Speed War Production

## ... Aim of 46th AFA Convention

**R**ESPONDING again, as it did in 1918, to demands for metals for war, the American Foundrymen's Association has dedicated this year's annual convention to the single subject of speeding war production. This theme dominates the technical sessions planned for the meeting, as well as the foundry material and equipment exhibition to be held in conjunction with the meeting. The convention, the 46th annual meeting of the association, will be held in Cleveland from April 20 to 24, with the equipment exhibit being housed in the municipal auditorium. Because of the trend to a six-day week, there will be no preview day on Saturday. Instead, the exhibits will be open until 10 p. m. Monday night.

In keeping with the national effort to establish closer hemispheric cooperation, the A.F.A. has designated the meeting as the First Western Hemisphere Foundry Congress. Outstanding foundry authorities from Central and South America are scheduled to present papers describing practice in their various countries. In addition, a special reception is planned for Monday afternoon for guests from the Pan American republics.



Some 47 technical sessions have been scheduled for the meeting, with each session organized to answer the question "Will it help speed war production?" A glance at the subject to be covered and the authorities who will speak suggests that anyone attending the meeting will find that question answered with an emphatic "yes."

The association's annual business meeting will be held on Wednesday, at which time the annual Awards Lecture will be presented and officers for the coming year elected. D. P. Forbes of Gunitite Foundries Corp., present vice-president of the group has been nominated for the presidency. L. C. Wilson of the

Reading Steel Casting division of the American Chain & Cable Co., Inc., has been nominated vice-president.

Despite the fact that most equipment makers are being severely pressed to maintain delivery promises, a large equipment exhibit, covering four large halls at the auditorium, is promised for this year. While many of the exhibitors will not be able to spare equipment for an operating exhibit, they are all planning on bringing their files along with them and are manning their booths with experts who will be in a position to discuss production problems.

Several government agencies, including the War Production Board and the Office of Price Administration will have consulting offices in the auditorium. This will present a splendid opportunity for foundrymen to find answers to many of the perplexing problems faced in operating under war time controls.

The Cleveland Post of the Army Ordnance Association is sponsoring an extensive display of military and naval equipment suitable for foundry production.

The program of the convention follows:

## Program of 46th Annual A.F.A. Convention

### Gray Iron Sessions

#### TUESDAY

9:00 AM—Shop Course (Session 1).  
Chairman—W. S. Linnell, Wisconsin Steel Co., Chicago.  
*Practical Theory of Shrinkage.*  
Discussion Leader—George Timmons, Climax Molybdenum Co., Detroit.

#### WEDNESDAY

9:00 AM—Shop Course (Session 2).  
Chairman—R. F. Hine, Studebaker Corp., South Bend, Ind.  
*Shrinkage in Automotive Castings.*  
Discussion Leader (to be announced).

#### 2:30 PM—

Chairman—Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.

Co-Chairman—John Lowe, Battelle Memorial Institute, Columbus, Ohio.

*Temperature Measurement of Molten Cast Iron With the "Rayotube" and Optical Pyrometer,* by R. H. Koch and Dr. A. E. Schuh, U. S. Pipe & Foundry Co., Burlington, N. J.

*Cupola Control,* by Fulton Holtby and H. F. Scobie, University of Minnesota, Minneapolis.

*Direct Determination of Combined Carbon in Cast Iron & Steel,* by J. G. Donaldson, Battelle Memorial Institute, Columbus, Ohio.

#### THURSDAY

9:00 AM—Shop Course (Session 3).  
Chairman—H. H. Wilder, Detroit Stoker Co., Monroe, Mich.

#### *Shrinkage in Pressure Castings.*

Discussion Leader—H. H. Judson, Goulds Pumps, Inc., Seneca Falls, N. Y.

#### 2:30 PM—

Chairman—S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago.

Co-Chairman—R. G. McElwee, Alloy Div., Vanadium Corp. of America, Detroit.

*Oxidation Resistance of Ordinary and Graphitized Cast Irons,* by C. O. Burgess and A. E. Schrub-sall, Union Carbide & Carbon Research Laboratories, Niagara Falls, N. Y.

*Cast Iron—Strength vs. Structure,* by R. R. Adams, Battelle Memorial Institute, Columbus, Ohio.

*Metallurgical Study of Cast Iron for Glass Forming Molds,* by W. H. Bruckner, University of Illinois, Urbana, Ill., and H. Czy-

Photo credit—Roberts & Mander Stove Co., from American Enameler



zewski, Caterpillar Tractor Co., Peoria, Ill.

#### FRIDAY

**9:00 AM—Shop Course (Session 4).**  
Chairman—P. T. Bancroft, Republic Coal & Coke Co., Moline, Ill.

*Shrinkage—General Castings.*  
Discussion Leader—E. J. Carmody, C. C. Kavin Co., Chicago.

**10:00 AM—**

Chairman—Dr. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham.

Co-Chairman—V. A. Crosby, Climax Molybdenum Co., Detroit.

*Production Hardening of Close Grain Cast Iron*, by D. V. Ludwig, Capitol Foundry Corp., Long Island City, N. Y.

*Effects of Alloys on Transformation*, by R. G. McElwee, Vanadium Corp. of America, Detroit.

*Effects of Ladle Inoculation on Austenitic Cast Iron*, by J. T. Eash, International Nickel Co., Bayonne, N. J.

**2:00 PM—**

Chairman—Dr. A. E. Schuh, United States Pipe & Foundry Co., Burlington, N. J.

*Elastic Properties of Some Alloy Cast Irons*, by A. I. Krynitsky and C. M. Saeger, Jr., National Bureau of Standards, Washington.

*Statistical Methods as an Aid to the Control of Foundry Operations*, by H. H. Fairfield, Canadian Dept. of Mines and Resources, Ottawa, Canada.

*Effects of Phosphorus on Growth of Cast Iron*, by Morris Cohen and M. N. Dastur, Massachusetts Institute of Technology, Cambridge, Mass.

### Malleable Sessions

#### MONDAY

**2:30 PM—**

Chairman—C. F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.  
Co-Chairman—R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

*Malleable Iron Gating and Riser*, by Fred Reeves, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

*Sand Control in a Mechanized Malleable Foundry*, by D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

#### TUESDAY

**10:00 AM—**

Symposium on Graphitization (Section 1).

Chairman—Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, Ohio.

Co-Chairman—D. P. Forbes, Gunite Foundries, Inc., Rockford, Ill.

*Principles of Graphitization*, by Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, Ohio.

*The Suppression of Primary Graphite*, by Dr. R. Schneidewind, University of Michigan, Ann Arbor, Michigan.



#### RETIRING PRESIDENT

H. S. Simpson of National Engineering Co., present president of A.F.A., who will retire this year. Mr. Simpson will, however, continue to serve the association as member of the Board of Directors.

*Some Effects of Hydrogen on the Time of Malleabilization*, by C. H. Lorig and M. L. Samuels, Battelle Memorial Institute, Columbus, Ohio.

*Temperature Control of Graphitizing Furnaces*, by J. H. Lansing, Malleable Founders' Society, Cleveland, Ohio.

*Atmosphere Control in Annealing Furnaces*, by R. J. Cowan, Surface Combustion Corp., Toledo, Ohio. (Symposium concluded at afternoon session.)

**12:30 PM—**

Malleable Division Luncheon.

**2:30 PM—**

Symposium on Graphitization (Section 2).

Chairman—Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland, Ohio.

Co-Chairman—Carl Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

*Intermittent Annealing Furnaces*, by W. R. Bean and W. R. Jaeschke, Whiting Corp., Harvey, Ill.

*Electric Furnace Annealing*, by R. M. Cherry, General Electric Co., Schenectady, N. Y.

*Tunnel Kiln Annealing*, by R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

*The Promotion of Annealing Rate by the Selection of Chemical Composition*, by W. D. McMillan, International Harvester Co., Chicago.

*Arrested Anneal Malleables*, by D. P. Forbes, Gunite Foundries Corp., Rockford, Ill.

### Steel Sessions

#### WEDNESDAY

**2:30 PM—**

Chairman—F. A. Melmoth, Detroit Steel Casting Co., Detroit.  
Co-Chairman—K. V. Wheeler, American Steel Castings Co., Newark, N. J.

*Grinding Wheel Cost Control*, by Jeff. Alan Westover, Dyer Engineers, Inc., Buffalo.

*Atmospheric Pressure and the Steel Casting—A New Technique of Gating and Riser*, by H. F. Taylor and E. A. Rominski, Naval Research Laboratories, Washington.

*Studies of Center Line Shrinkage*, by J. A. Duma and S. W. Brinson, Norfolk Navy Yard, Portsmouth, Va.

**8:00 PM—**

Chairman—L. C. Wilson, Reading Steel Casting Div., American Chain and Cable Co., Inc., Reading, Pa.

*Steel Pouring Refractories*, by R. H. Stone, Vesuvius Crucible Co., Swissvale, Pa.

*Use of Iron Oxides in Cores for Steel Castings*, by F. B. Riggan, Key Co., E. St. Louis, Ill.

Report of Committee on Radiography.

#### THURSDAY

**12:30 PM—**

Steel Division Round-Table Luncheon.

#### FRIDAY

**10:00 AM—**

Chairman—C. E. Sims, Battelle Memorial Institute, Columbus, Ohio.

Co-Chairman—John Howe Hall, Philadelphia.

*Methods for Producing Steel for Castings.*

*Acid Electric Furnace Slag Control*, by John Juppenlatz, Lebanon Steel Foundry, Lebanon, Pa.

*Acid Open Hearth Practice for Steel Castings*, by G. S. Baldwin, Standard Steel Works Division, Baldwin Locomotive Works, Burnham, Pa., and C. W. Briggs, Steel Founders' Society of America, Cleveland.

*Making Navy Steel in Basic Electric Furnaces*, by S. W. Brinson and F. B. Anderson, Norfolk Navy Yard, Portsmouth, Va.

*Protection of Uniform Steel for a Light Castings Foundry*, by C. H. Kain and L. W. Sanders, Lake & Elliott, Braintree, Essex. (I.B.F. Exchange Paper.)

**2:00 PM—**

Chairman—R. A. Gezelius, General Castings Corp., Eddystone, Pa.

Co-Chairman—Henry Phillips, Lebanon Steel Foundry, Lebanon, Pa.

*Properties of Low Alloy Copper Cast Steels*, by H. F. Taylor, H. F. Bishop and E. A. Rominski,

Naval Research Laboratory, Washington.  
*Welding of Medium Carbon Steel Castings by Metal Arc Process*, by S. E. Mueller, Falk Corp., Milwaukee; A. B. Smith, American Bureau of Ships, Chicago, and J. F. Oesterle, University of Wisconsin, Madison, Wis.  
 Report of Committee on Developments in Magnetic Powder Test.

## Sand Sessions

### TUESDAY

#### 9:00 AM—Sand Shop Course (Session 1.)

Chairman—D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.  
*Fundamentals of Sand Control*, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, New Jersey.

### WEDNESDAY

#### 9:00 AM—Sand Shop Course (Session 2.)

Chairman—C. P. Randall, Eastern Clay Products Co., Eifort, Ohio.  
*Practical Fundamentals of Sand Shop Control*, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

#### 8:00 PM—Sand Research Session.

Chairman—L. B. Knight, Jr., National Engineering Co., Chicago.  
 Co-Chairman—F. L. Weaver, Great Lakes Foundry Sand Co., Detroit.  
*Investigation of Durability of Foundry Sands*, by J. CoVan and C. E. Schubert, University of Illinois, Urbana, Ill.  
*Investigation of Foundry Sands Durability*, by A. S. Nichols, Illinois Clay Products Co., Chicago.  
*Causes of Drying Out of Synthetic Sands*, by N. J. Dunbeck, Eastern Clay Products Co., Eifort, Ohio.

### THURSDAY

#### 9:00 AM—Sand Shop Course (Session 3.)

Chairman—E. E. Woodliff, Harry W. Dietert Co., Detroit.  
*Practical Fundamentals of Sand Control*, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

### FRIDAY

#### 9:00 AM—Sand Shop Course (Session 4.)

Chairman—E. E. Woodliff, Harry W. Dietert Co., Detroit, Mich.  
*Practical Fundamentals of Sand Control*, by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

#### 10:00 AM—Sand Research Session.

Chairman—N. J. Dunbeck, Eastern Clay Products Co., Eifort, Ohio.  
 Co-Chairman—C. M. Saeger, National Bureau of Standards, Washington, D. C.  
*Investigation of Sand Properties at High Temperatures—Committee Report.*



## PRESIDENT-ELECT

D. P. Forbes of Gunite Foundries Corp., who served the past year as vice-president of A.F.A., has been nominated president, to lead the association in 1942 and 1943.

*Flowability of Molding Sands in Terms of Work*, by E. O. Lissell, University of Michigan, Ann Arbor, Mich.  
*Resin Binders in Molding Sand*, by E. Pragoff, Hercules Powder Co., Wilmington, Del.

## Non-Ferrous Sessions

### MONDAY

#### 2:30 PM—

Chairman—M. V. Healey, General Electric Co., Schenectady, N. Y.  
 Co-Chairman—D. Frank O'Connor, Watts Regulator Co., Lawrence, Mass.  
*Plaster Molds for Precision Non-Ferrous Castings*, by Henry Hagemeyer, Castings Patent Corp., Chicago.  
*Tentative Recommended Practices for Tin Bronzes—Committee Report.*

### TUESDAY

#### 10:00 AM—

Chairman—W. J. Laird, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.  
 Co-Chairman—Wm. Romanoff, H. Kramer & Co., Chicago.  
*Effect of Furnace Atmospheres on Heat Treating of Magnesium and Aluminum Alloys*, by D. V. Ludwig, Capitol Foundry Corp., Long Island City, N. Y., and Wayne Martin, Sperry Gyroscope Co., New York.  
*Salvage of Aluminum Alloys by Welding*, by A. T. Ruppe, Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.  
 Annual Business Meeting of Non-Ferrous Division, A.F.A.

#### 12:30 PM—Round-Table Luncheon.

Chairman—B. A. Miller, Cramp Brass & Iron Foundries Div., Baldwin Locomotive Works, Philadelphia.  
 Vice-Chairman—C. O. Thieme, H. Kramer & Co., Chicago.  
 Discussion Topics and Leaders:  
*"Some Causes of Porosity in Silicon Bronze Castings,"* by J. E. Crown, U. S. Naval Gun Factory, Washington, D. C.  
*"Some Causes of Porosity in Navy 'G' and 'M' Metals,"* by W. B. George, R. Lavin & Sons, Chicago.

#### 6:30 PM—Non-Ferrous Division Dinner.

Presiding—Wm. J. Laird, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

## Miscellaneous

### MONDAY

#### 4:30 PM—Core Practice-Lecture Course.

Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit.

#### 8:00 PM—Patternmaking Session.

Chairman—Frank Cech, Cleveland Trade School, Cleveland.  
 Co-Chairman—V. J. Sedlon, Master Pattern Co., Cleveland.  
*Design of Core Boxes and Driers for Core Blowing*, by O. A. Van Sickle, City Pattern Works, Detroit.  
*Equipment for Blowing Cores*, by R. F. Lincoln, Osborn Mfg. Co., Cleveland.  
*Production of Copper Castings*, by A. K. Laukel, Electro-Chemical Pattern & Mfg. Co., Detroit.

### TUESDAY

#### 10:00 AM—Apprentice Training Session.

Chairman—Jas. G. Goldie, Cleveland Trade School, Cleveland.  
 Co-Chairman—Dean C. J. Freund, University of Detroit, Detroit.  
*Foundry Apprenticeship Now, How and Why*, by Donald F. Lane, Bethlehem Steel Co., Sparrows Point, Md.  
 Foundry Defense Training Question Box.  
 Discussion Leader—O. F. Carpenter, Associate District Representative, Training Within Industry, Detroit.

#### 11:45 AM—Special War Production Session.

Chairman—Fred J. Walls, International Nickel Co., Detroit.  
 (Speaker to be announced.)

#### 2:30 PM—Patternmaking Session

Chairman—E. J. Brady, Western Foundry Co., Chicago.  
 Co-Chairman—A. Pyle, Jr., Pyle Pattern & Mfg. Co., Muskegon, Mich.  
*Plastic Coatings for Core Boxes and Patterns*, Report of Investigation by George Dreher, Ampco Metal, Inc., Milwaukee.  
*Discussion of Rubber Coatings for Core Boxes*, by J. E. Crown, U. S. Naval Gun Factory, Washington.  
*Specifications for Foundry and Pat-*



**Annual Business Meeting  
10:00 A.M.—Wednesday**

- tern Lumber*, by E. T. Kindt, Kindt-Collins Co., Cleveland.  
*Driers and Green Topping Cores*, by George Gedeon, Aluminum Co. of America, and Frank C. Cech, Cleveland Trade School.  
**4:30 PM—Core Practice Course.**  
 Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit.  
**6:30 PM—Annual Apprentice Instructors' Dinner.**  
 Presiding — James G. Goldie, Cleveland Trade School, Cleveland, Ohio.

**WEDNESDAY**

- 2:30 PM—Plant Defense and Protection.**  
 Report of Committee on Plant Protection During War Times, by Jas. R. Allan, International Harvester Co., Chicago.  
**3:00 PM—Chapter Delegate Conference.**  
**4:30 PM—Core Practice Course.**  
 Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit.  
**6:30 PM—Annual Engineering Foundry Instructors' Dinner.**  
**8:00 PM—Job Evaluation and Time Study Session.**  
 Chairman—F. E. Wartgow, American Steel Foundries, East Chicago, Ind.  
 Co-Chairman—J. Allan Westover, Dyer Engineers, Inc., Cleveland.  
*The Use of Job Evaluation in the Application of Time Study*, by E. L. Berry and E. A. Berg, Link-Belt Ordnance Co., Chicago.  
**8:00 PM—The Foundry Industry and Engineering Training Session.**

- Chairman—F. G. Sefing, International Nickel Co., New York.  
 Co-Chairman—A. C. Davis, Cornell University, Ithaca, N. Y.  
*Report of Survey of Foundry Instruction*, by A.F.A. Committee on Cooperation with Engineering Schools.  
*Engineering Graduates in the Foundry*, by S. D. Moxley, American Cast Iron Pipe Co., Birmingham.  
*The College Student Views the Foundry Industry*, by C. J. Freund, Dean of Engineering, University of Detroit, Detroit.

**THURSDAY**

- 10:00 AM—Foundry Costs and Merchandising of Castings.**

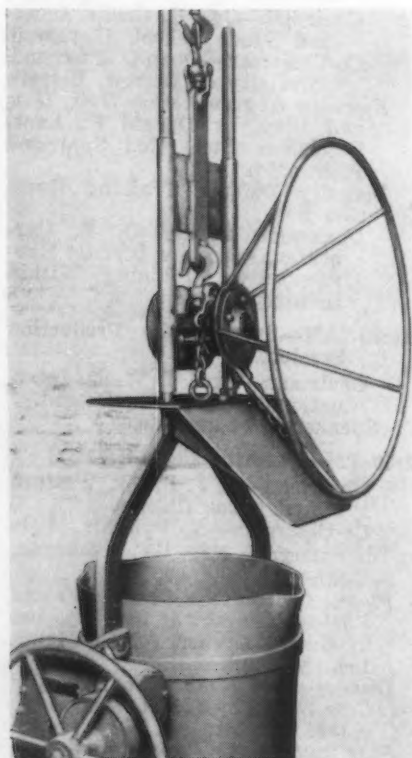
**Pan American Sessions**

**MONDAY**

- 5:30 PM—Reception to Guests from Central and South American Countries.**  
**8:00 PM—Western Hemisphere Foundry Conference.**  
 Presiding—Harold J. Roast, Canadian Bronze Co., Ltd., Montreal, Canada.  
*Brass Founding in Mexico*, by H. H. Miller, Fundicion de Bronce Miller, Torreón, Coah., Mexico.  
*Some Aspects of the Gray Iron Founding Practice in Brazil*, by Miguel Siegel, Instituto de Pesquisas Tecnológicas, São Paulo, Brazil.  
*Brazilian Foundry Industry*, by H. A. Hunnicutt, Industrias Químicas Brasileiras, São Paulo, Brazil.  
*Designing for Foundry Production*, by Dr. Ernest Gieger, São Paulo, Brazil.

**Annual Dinner  
7:30 P.M.—Thursday**

- Chairman—R. L. Lee, Liberty Foundry Div., Grede Foundries, Inc., Wauwatosa, Wis.  
 Round Table Discussion on Current Cost Methods Problems.  
**10:00 AM—Cupola Research Project.**  
 Chairman—D. J. Reese, International Nickel Co., New York.  
 Reports of Sub-Committees of Cupola Research Project.  
**11:45 AM—War Production Session.**  
*Training Methods for War Production*, by Wm. F. Patterson, Federal Committee on Apprenticeship, Washington.  
**2:30 PM—Plant and Plant Equipment.**  
 Chairman—James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind.  
 Co-Chairmen—W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa; E. W. Beach, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich.  
*Casting Cleaning in a Gray Iron Foundry*, by H. B. Nye, New York Air Brake Co., Watertown, N. Y.  
*Priorities and Foundry Equipment*, by W. R. Bean, Chief, Foundry Equipment and Supplies Unit, Tools Section, War Production Board, Washington.  
**FRIDAY**  
**11:45 AM—War Production Session.**  
 (Speaker to be announced.)  
**4:30 PM—Core Practice-Lecture Course.**  
 Lecturer—H. W. Dietert, Harry W. Dietert Co., Detroit, Mich.



**Continuous Pouring Ladle Handler**

**A** NEW ladle handler designed to make it possible to change easily and quickly ladle elevation in hot metal delivery systems and to permit one man to pour continuously a large number of molds fed by a monorail pouring system has been developed by Whiting Corp., Harvey, Ill. The handler, illustrated herewith, is available in various capacities from 300 lb. up. It has a rugged telescoping frame which can be clamped to various types of ladle bails. The frame is of rigid construction to eliminate swinging. A large hand wheel makes it possible to elevate the ladle quickly and with minimum effort. The hoist

mechanism is self-locking and is suspended from the trolley independently of the frame. A ladle lift of 2 ft. is provided, with a minimum monorail headroom of 9 ft. A ladle of 1000 lb. capacity can be lifted with only 35 lb. pull on the hand wheel.

The unit can be fastened to any standard monorail trolley generally used in foundries and all running parts are totally enclosed in a dirt-proof housing and operates in a bath of oil. The hand wheel is shielded to keep it cool. A swivel clamp permits the wheel to be set at the most convenient position for pouring and the height of the wheel remains constant regardless of the ladle elevation.

The rigid construction of the frame eliminates any tendency of the ladle to swing and expedites the spotting.

**T**HE new ladle handler at left developed by Whiting Corp.

# Chemical Analysis by X-Ray Diffraction

By M. L. FULLER  
New Jersey Zinc Co.,  
Research Division,  
Palmerton, Pa.

EVER present problems in the metallurgical and chemical industries are those of chemical analysis and the identification of materials. The importance of the standard methods in the chemical laboratory of determining the composition of a material is well recognized.

Supplementing the classical methods of chemical analysis, various new methods such as spectrographic analysis, electrometric analysis, microanalysis, and X-ray diffraction have been adopted. While many of these new methods give the same type of information as obtainable by the older methods, the X-ray diffraction technique, in special applications, yields knowledge concerning the composition of a material that is unobtainable or difficult to obtain by other methods. The special value of the X-ray method lies in its ability to detect and identify chemical compounds or alloy phases.

The accompanying illustration shows the X-ray diffraction photographs of two different chemical compounds. In taking these photographs a beam of X-rays is allowed to strike the specimen undergoing examination in a special camera, arranged to record the X-rays that are reflected by the specimen. From an optical standpoint, this phenomenon is known as diffraction; the specimen acting as the diffraction grating and the photograph obtained being the diffraction pattern. Each element, chemical compound, and alloy phase has its characteristic diffraction pattern by which its presence in a material can be established. When more than one constituent is present, the resulting photograph consists of the patterns of all constituents superimposed.

The distinctive feature of the X-ray diffraction method of analysis is that the chemical compounds present in the unknown material

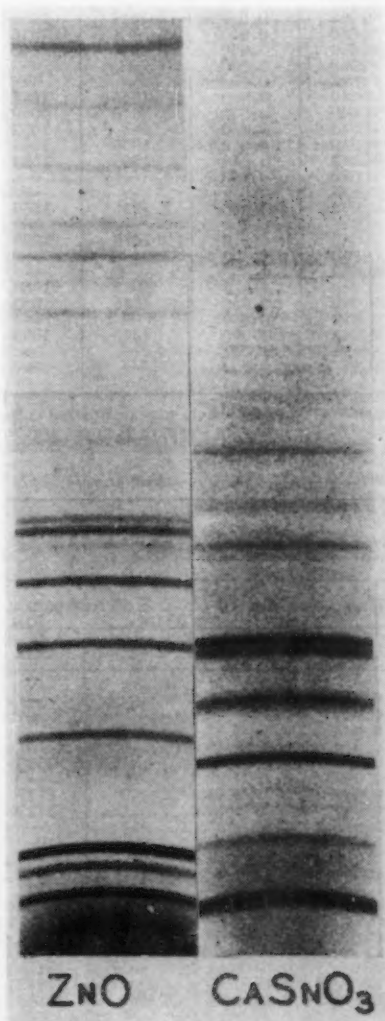
are identifiable, whereas, in ordinary chemical analysis usually only the constituent element can be determined. This may be illustrated by a hypothetical case. A sample is analyzed in the chemical laboratory and reported as 24.3 per cent FeO,

20.4 per cent  $\text{SiO}_2$  and 55.3 per cent ZnO. These results do not indicate whether the sample is a mixture of FeO and  $\text{Zn}_2\text{SiO}_4$ ; ZnO and  $\text{FeSiO}_3$ ;  $\text{Zn}_2\text{SiO}_4$ ,  $\text{FeSiO}_3$ , ZnO and FeO; or FeO, ZnO and  $\text{SiO}_2$ . Supplementing the usual chemical analysis with an X-ray analysis would indicate exactly what compounds are present.

The importance of the X-ray diffraction method to industry is indicated by the fact that the American Society for Testing Materials, in cooperation with the National Research Council, has recently published the X-ray diffraction pattern data for some 1300 elements and compounds. This information is printed as a card index comprising about 4000 cards, and is classified according to the positions of the three strongest lines of the patterns of each element and compound.

In analyzing an unknown material the X-ray diffraction pattern is photographed and the line positions and relative intensities are measured. By reference to the card index the identity of the unknown can be established if the patterns of the components are included in the index. The detection of minor constituents is usually not possible if the concentration of that constituent in the mixture is less than about 10 per cent. This is a disadvantage in some cases but in other cases, where the interest is mainly in identifying the major constituents, the interpretation of the pattern is much simpler and more certain than it would be if the patterns of all the very minor phases were also present in the X-ray photograph.

Most applications of the X-ray method in industry have been in the field of qualitative analysis, for which the method has many unique applications. In very special cases a semi-quantitative analysis can be made with the aid of synthetic comparison standards.



X-RAY diffraction patterns of two chemical compounds.



# Correlated SAE and AISI R

## CARBON STEELS

AISI Numbers		Chemical Composition Limits, Per Cent				SAE Numbers	
1942	1941	C	Ma	P, Max.	S, Max.	1941	1942
C 1006	C 1006	0.08 max.	0.25/0.40	0.040	0.050	—	—
C 1008	C 1008	0.10 max.	0.30/0.50	0.040	0.050	—	1008
CB 1008	CB 1008	0.10 max.	—	—	—	—	—
C 1010	C 1010	0.08/0.13	0.30/0.50	0.040	0.050	1010	1010
C 1012	C 1012	0.10/0.15	0.30/0.50	0.040	0.050	—	—
CB 1012	CB 1012	0.15 max.	—	—	—	—	—
C 1014	C 1014	0.13/0.18	0.40/0.60	0.040	0.050	—	—
C 1015	C 1014	0.13/0.18	0.30/0.50	0.040	0.050	1015	1015
C 1016	C 1016	0.13/0.18	0.60/0.90	0.040	0.050	X 1015	1016
CB 1017	CB 1017	0.10/0.25	—	—	—	—	—
C 1017	C 1017	0.15/0.20	0.40/0.60	0.040	0.050	—	—
C 1018	C 1018	0.15/0.20	0.60/0.90	0.040	0.050	—	—
C 1019	C 1019	0.15/0.20	0.70/1.00	0.040	0.050	—	—
C 1020	C 1020	0.18/0.23	0.30/0.50	0.040	0.050	1020	1020
C 1021	C 1021	0.18/0.23	0.40/0.60	0.040	0.050	—	—
C 1022	C 1022	0.18/0.23	0.70/1.00	0.040	0.050	X 1020	1022
C 1023	C 1023	0.20/0.25	0.30/0.50	0.040	0.050	—	—
C 1024	—	0.20/0.26	1.35/1.65	0.040	0.050	—	1024
C 1025	C 1025	0.22/0.28	0.30/0.50	0.040	0.050	1025	1025
C 1026	C 1026	0.22/0.28	0.40/0.60	0.040	0.050	—	—
C 1029	C 1029	0.25/0.31	0.60/0.90	0.040	0.050	—	—
C 1030	C 1030	0.28/0.34	0.60/0.90	0.040	0.050	1030	1030
CB 1032	CB 1032	0.25/0.40	—	—	—	—	—
C 1033	C 1033	0.30/0.36	0.60/0.90	0.040	0.050	—	—
C 1035	C 1035	0.32/0.38	0.60/0.90	0.040	0.050	1035	1035
C 1036	—	0.32/0.39	1.20/1.50	0.040	0.050	—	1036
C 1040	C 1040	0.37/0.44	0.60/0.90	0.040	0.050	1040	1040
C 1042	C 1042	0.40/0.47	0.60/0.90	0.040	0.050	—	—
C 1043	C 1043	0.40/0.47	0.70/1.00	0.040	0.050	—	—
C 1045	C 1045	0.43/0.50	0.60/0.90	0.040	0.050	1045	1045
C 1050	—	0.48/0.55	0.60/0.90	0.040	0.050	1050	1050
C 1052	—	0.47/0.55	1.20/1.50	0.040	0.050	—	1052
C 1055	C 1055	0.50/0.60	0.60/0.90	0.040	0.050	1055	1055
C 1060	—	0.55/0.65	0.60/0.90	0.040	0.050	1060	1060
C 1061	C 1061	0.54/0.65	0.75/1.05	0.040	0.050	—	—
C 1064	C 1064	0.60/0.70	0.50/0.70	0.040	0.050	—	—
C 1066	C 1066	0.60/0.71	0.80/1.10	0.040	0.050	X 1065	1066
C 1068	C 1068	0.65/0.75	0.50 max.	0.040	0.050	—	—
C 1070	—	0.65/0.75	0.70/1.00	0.040	0.050	1070	1070
C 1074	C 1074	0.70/0.80	0.50/0.70	0.040	0.050	—	—
C 1078	C 1078	0.72/0.85	0.30/0.50	0.040	0.050	—	—
C 1080	—	0.75/0.88	0.60/0.90	0.040	0.050	1080	1080
C 1085	C 1085	0.80/0.93	0.70/1.00	0.040	0.050	1085	1085
C 1086	C 1083	0.82/0.95	0.30/0.50	0.040	0.050	—	—
C 1095	C 1095	0.90/1.05	0.30/0.50	0.040	0.050	1095	1095
B 1008	B 1008	0.10 max.	0.30/0.50	0.11	0.060	—	—
B 1011	B 1011	0.13 max.	0.50/0.70	0.11	0.060	—	—

NOTE 1: When silicon is specified in standard basic open-hearth steels, silicon may be ordered only as 0.10 per cent maximum; 0.10 to 0.20 per cent; or 0.15 to 0.30 per cent. In the case of many grades of basic open-hearth steel, special practice is necessary in order to comply with a specification including silicon.

NOTE 2: Acid bessemer steel is not furnished with specified silicon content.

## FREE-CUTTING, SULPHURIZED STEELS FOR BARS

AISI Numbers		Chemical Composition Limits, Per Cent				SAE Numbers	
1942	1941	C	Ma	P, Max.	S, Max.	1941	1942
C 1109	C 1109	0.08/0.13	0.60/0.90	0.045	0.08/0.13	—	—
C 1110	C 1110	0.08/0.13	0.60/0.90	0.045	0.10/0.15	—	—
C 1112	C 1112	0.10/0.16	1.00/1.30	0.045	0.08/0.13	—	—
C 1113	C 1113	0.10/0.16	1.00/1.30	0.045	0.24/0.33	—	—
C 1115	C 1116	0.13/0.18	0.70/1.00	0.045	0.10/0.15	1115	1115
C 1116	—	0.14/0.20	1.10/1.40	0.045	0.16/0.23	—	—
C 1117	C 1117	0.14/0.20	1.00/1.30	0.045	0.08/0.13	X 1314	1117
C 1118	C 1118	0.14/0.20	1.30/1.60	0.045	0.08/0.13	X 1315	1118
C 1120	C 1120	0.18/0.23	0.60/0.90	0.045	0.08/0.13	—	—
C 1121	C 1121	0.18/0.23	0.70/1.00	0.045	0.08/0.13	—	—
C 1122	C 1122	0.17/0.23	1.35/1.65	0.045	0.08/0.13	—	—
C 1132	C 1132	0.27/0.34	1.35/1.65	0.045	0.08/0.13	X 1330	1132
C 1137	C 1137	0.32/0.39	1.35/1.65	0.045	0.08/0.13	X 1335	1137
C 1141	—	0.37/0.45	1.35/1.65	0.045	0.08/0.13	X 1340	1141
C 1144	—	0.40/0.48	1.35/1.65	0.045	0.24/0.33	—	—
C 1217	—	0.14/0.19	0.70/1.00	0.09/0.13	0.20/0.29	—	—
B 1110	B 1110	0.13 max.	0.60 max.	0.11 max.	0.045/0.075	—	—
B 1111	B 1111	0.08/0.13	0.60/0.90	0.09/0.13	0.10/0.15	—	1111
B 1112	B 1112	0.08/0.13	0.60/0.90	0.09/0.13	0.16/0.23	1112	1112
B 1113	B 1113	0.08/0.13	0.60/0.90	0.09/0.13	0.24/0.33	X 1112	1113

NOTE 1: Sulphurized steel is not subject to check analysis for sulphur.

NOTE 2: Acid bessemer steel is not furnished with specified silicon content.

NEW revisions to the "Combined Standard Steel Lists of American Iron and Steel Institute and the Society of Automotive Engineers" were released on Jan. 21, as supplementary information to Manufacturers' Standard Practice, bringing up to date these standard steel lists. New steels as well as some renumbered steels are listed in accordance to their chemical analysis ranges.

In anticipation of a shortage of alloy steels, representatives of the American Iron and Steel Institute, Society of Automotive Engineers, other technical societies and interested manufacturers met and drew up National Emergency Steel Specifications at the request of the OPM, now the WPB. These recommended steels of low alloy content are described in the new American Iron and Steel Institute Manual No. 5 entitled, "Possible Alternates for Nickel, Chromium and Chromium-Nickel Constructional Alloy Steels," published in January, 1942. The conservation of alloying elements in these steels is based chiefly upon the principle that small quantities of several different elements are more effective than larger quantities of any single element found in such combinations.

It is certain that these National Emergency Steels and certain others containing none or less strategic materials will soon be the only steels available. Steels containing the elements nickel, chromium, tungsten, cobalt and vanadium may only be used on extremely important functional parts. Hence industry is being urged by WPB to use carbon and intermediate manganese steels (1000, 1100 and 1200 series); carbon molybdenum (4000 series); manganese molybdenum (8000, 8100, 8200, 8300, 8400 and 8500 series) or silicon manganese (9200 series) steels wherever available. The 8000 series steels have been designated National Emergency Standard Steels.

# I Revised Standard Steels

Capital letter prefixes are used to indicate the types of steel by manufacturing methods, and are as follows:

- A—Basic open-hearth alloy steel.
- B—Acid bessemer carbon steel.
- C—Basic open-hearth carbon steel.
- CB—Either acid bessemer or basic open-hearth steel.
- D—Acid open-hearth carbon steel.
- E—Electric furnace steel.
- NE—National Emergency Standard steel, a WPB designation.

This program of standardizing steel specifications was begun by AISI and SAE some time ago, and the first list of such standardizations appeared in THE IRON AGE on Oct. 16, 1941. Unless otherwise designated, the steels listed in the accompanying tables are subject

TABLE OF SUBSTITUTE STEELS

Standard Series Designation		Possible Alternates National Emergency Steels		
1942 AISI Number	1942 SAE Number	Number	Number	Number
A 1320	1320	A 4027	NE 8024	—
A 1330	1330	A 4037	NE 8233	—
A 1340	1340	A 4047	NE 8245	—
A 2317	2317	A 4027	NE 8024	NE 8620
A 2330	2330	A 4037	NE 8233	NE 8630
A 2335	—	A 4063	NE 8339	NE 8739
A 2340	2340	A 4068	NE 8442	NE 8744
A 2345	2345	A 4068	NE 8447	NE 8749
WD 2350	—	A 4068	NE 8547	NE 8949
A 2515	2515	A 4027	NE 8817	—
A 3045	—	A 4068	NE 8442	NE 8744
A 3120	3120	A 4027	NE 8024	NE 8620
A 3130	3130	A 4037	NE 8233	NE 8630
A 3135	3135	A 4063	NE 8339	NE 8739
A 3140	3140	A 4068	NE 8442	NE 8744
A 3141	3141	A 4068	NE 8447	NE 8749
A 3145	3145	A 4068	NE 8447	NE 8749
A 3150	3150	A 4068	NE 8547	NE 8949
A 3240	3240	A 4068	NE 8442	NE 8744
WD 3250	—	A 4068	NE 8547	NE 8949
A 4119	4119	A 4027	NE 8024	—
A 4130	4130	A 4037	NE 8233	NE 8630
A 4137	4137	A 4063	NE 8339	NE 8739
A 4142	—	A 4063	NE 8442	NE 8744
A 4145	4145	A 4068	NE 8447	NE 8749
A 4150	4150	A 4068	NE 8547	NE 8949
A 4320	4320	—	NE 8124	NE 8724
A 4340	4340	A 4068	NE 8547	NE 8949
A 4620	4620	A 4027	NE 8024	NE 8620
A 4640	4640	A 4063	NE 8339	NE 8739
A 4645	—	A 4068	NE 8447	NE 8744
A 4650	—	A 4068	NE 8547	NE 8949
A 4820	4820	—	NE 8124	NE 8724
A 5045	—	A 4063	NE 8339	—
A 5120	5120	A 4027	NE 8024	—
A 5130	—	A 4037	NE 8233	—
A 5140	5140	A 4063	NE 8339	—
A 5145	—	A 4068	NE 8442	—
A 5150	5150	A 4068	NE 8447	—
A 6120	—	A 4027	NE 8024	NE 8620
—	6130	A 4037	NE 8233	NE 8630
WD 6140	—	A 4063	NE 8339	NE 8739
A 6145	—	A 4068	NE 8442	NE 8744
A 6150	6150	A 4068	NE 8447	NE 8749

Open-Hearth Alloy and Electric Furnace Alloy Steels Subject to Standard Variations for Check Analysis

AISI Numbers		Chemical Composition Limits, Per Cent										SAE Numbers	
1942	1941	C	Mn	P	S	Si	Ni	Cr	Mo	V	1941	1942	
Manganese Steels													
A 1320	A 1321	0.18/0.23	1.60/1.90	0.040	0.040	0.20/0.35	—	—	—	—	—	1320	
A 1330	A 1330	0.28/0.33	1.60/1.90	0.040	0.040	0.20/0.35	—	—	—	—	1330	1330	
A 1335	A 1335	0.33/0.38	1.60/1.90	0.040	0.040	0.20/0.35	—	—	—	—	1335	1335	
A 1340	A 1340	0.38/0.43	1.60/1.90	0.040	0.040	0.20/0.35	—	—	—	—	1340	1340	
Nickel Steels													
A 2317	A 2317	0.15/0.20	0.40/0.60	0.040	0.040	0.20/0.35/3.25/3.75	—	—	—	—	2315	2317	
A 2330	A 2330	0.28/0.33	0.60/0.80	0.040	0.040	0.20/0.35/3.25/3.75	—	—	—	—	2330	2330	
A 2335	A 2335	0.33/0.38	0.60/0.80	0.040	0.040	0.20/0.35/3.25/3.75	—	—	—	—	—	—	
A 2340	A 2340	0.38/0.43	0.70/0.90	0.040	0.040	0.20/0.35/3.25/3.75	—	—	—	—	2340	2340	
A 2345	—	0.43/0.48	0.70/0.90	0.040	0.040	0.20/0.35/3.25/3.75	—	—	—	—	2345	2345	
E 2512	E 2512	0.09/0.14	0.45/0.60	0.025	0.025	0.20/0.35/4.75/5.25	—	—	—	—	—	—	
A 2515	A 2514	0.12/0.17	0.40/0.60	0.040	0.040	0.20/0.35/4.75/5.25	—	—	—	—	2515	2515	
E 2517	E 2517	0.15/0.20	0.45/0.60	0.025	0.025	0.20/0.35/4.75/5.25	—	—	—	—	—	—	
Nickel Chromium Steels													
A 3045	A 3045	0.43/0.48	0.75/0.95	0.040	0.040	0.20/0.35/0.60/0.80	0.60/0.80	—	—	—	—	—	
A 3115	A 3115	0.13/0.18	0.40/0.60	0.040	0.040	0.20/0.35	1.10/1.40	0.55/0.75	—	—	3115	3115	
A 3120	A 3120	0.17/0.22	0.60/0.80	0.040	0.040	0.20/0.35	1.10/1.40	0.55/0.75	—	—	3120	3120	
A 3130	A 3130	0.28/0.33	0.60/0.80	0.040	0.040	0.20/0.35	1.10/1.40	0.55/0.75	—	—	3130	3130	
A 3135	A 3135	0.33/0.38	0.60/0.80	0.040	0.040	0.20/0.35	1.10/1.40	0.55/0.75	—	—	3135	3135	
A 3140	A 3140	0.38/0.43	0.70/0.90	0.040	0.040	0.20/0.35	1.10/1.40	0.55/0.75	—	—	3140	3140	
A 3141	A 3141	0.38/0.43	0.70/0.90	0.040	0.040	0.20/0.35	1.10/1.40	0.70/0.90	—	—	X 3140	3141	
A 3145	A 3145	0.43/0.48	0.70/0.90	0.040	0.040	0.20/0.35	1.10/1.40	0.70/0.90	—	—	3145	3145	
A 3150	A 3150	0.48/0.53	0.70/0.90	0.040	0.040	0.20/0.35	1.10/1.40	0.70/0.90	—	—	3150	3150	
A 3240	A 3240	0.38/0.45	0.40/0.60	0.040	0.040	0.20/0.35	1.65/2.00	0.90/1.20	—	—	3240	3240	
E 3310	E 3310	0.08/0.13	0.45/0.60	0.025	0.025	0.20/0.35	3.25/3.75	1.40/1.75	—	—	3312	3310*	
E 3316	E 3316	0.14/0.19	0.45/0.60	0.025	0.025	0.20/0.35	3.25/3.75	1.40/1.75	—	—	—	—	
Carbon Molybdenum Steels (New Series)													
A 4023	A 4023	0.20/0.25	0.70/0.90	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4023	
A 4024	A 4024	0.20/0.25	0.70/0.90	0.040	0.035/0.050	0.20/0.35	—	—	0.20/0.30	—	—	—	
A 4027	—	0.25/0.30	0.70/0.90	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4027	
A 4028	A 4027	0.25/0.30	0.70/0.90	0.040	0.035/0.050	0.20/0.35	—	—	0.20/0.30	—	—	—	
A 4032	A 4032	0.30/0.35	0.70/0.90	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4032	
A 4037	A 4037	0.35/0.40	0.75/1.00	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4037	
A 4042	A 4042	0.40/0.45	0.75/1.00	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4042	
A 4047	A 4047	0.45/0.50	0.75/1.00	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4047	
A 4063	A 4063	0.60/0.67	0.75/1.00	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4063	
A 4068	—	0.64/0.72	0.75/1.00	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	4068	
Chromium Molybdenum													
A 4119	A 4119	0.17/0.22	0.70/0.90	0.040	0.040	0.20/0.35	—	0.40/0.60	0.20/0.30	—	—	4119	
A 4120	A 4120	0.17/0.22	0.70/0.90	0.040	0.040	0.20/0.85	—	0.60/0.80	0.20/0.30	—	—	—	
A 4125	—	0.23/0.28	0.70/0.90	0.040	0.040	0.20/0.35	—	0.40/0.60	0.20/0.30	—	—	4125	
A 4130	A 4130	0.28/0.33	0.40/0.60	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	X 4130	4130	
E 4132	E 4132	0.30/0.35	0.40/0.60	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	—	—	
A 4134	A 4134	0.32/0.37	0.40/0.60	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	—	—	
E 4135	E 4135	0.33/0.38	0.70/0.90	0.025	0.025	0.20/0.35	—	0.80/1.10	0.15/0.25	—	—	—	
A 4137	A 4137	0.35/0.40	0.70/0.90	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	—	4137	
E 4137	E 4137	0.35/0.40	0.70/0.90	0.025	0.025	0.20/0.35	—	0.80/1.10	0.15/0.25	—	—	—	
A 4140	—	0.38/0.43	0.75/1.00	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	4140	4140	
A 4142	A 4142	0.40/0.45	0.75/1.00	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	—	—	
A 4143	A 4143	0.40/0.45	0.75/1.00	0.040	0.040	0.20/0.35	—	0.80/1.10	0.30/0.40	—	—	—	
A 4145	—	0.43/0.48	0.75/1.00	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	—	4145	
A 4150	—	0.46/0.53	0.75/1.00	0.040	0.040	0.20/0.35	—	0.80/1.10	0.15/0.25	—	4150	4150	
E 4150	E 4150	0.48/0.53	0.70/0.90	0.025	0.025	0.20/0.35	—	0.80/1.10	0.20/0.27	—	—	—	
A 4317	A 4317	0.15/0.20	0.45/0.65	0.040	0.040	0.20/0.35	1.65/2.00	0.40/0.60	0.20/0.30	—	—	—	
A 4320	A 4320	0.17/0.22	0.45/0.65	0.040	0.040	0.20/0.35	1.65/2.00	0.40/0.60	0.20/0.30	—	4320	4320	
A 4337	A 4337	0.35/0.40	0.60/0.80	0.040	0.040	0.20/0.35	1.65/2.00	0.60/0.80	0.30/0.40	—	—	—	
E 4337	E 4337	0.35/0.40	0.60/0.80	0.025	0.025	0.20/0.35	1.65/2.00	0.70/0.90	0.23/0.30	—	—	—	
A 4340	—	0.38/0.43	0.60/0.80	0.040	0.040	0.20/0.35	1.65/2.00	0.70/0.90	0.20/0.30	—	X 4340	4340	
E 4342	E 4340	0.40/0.45	0.60/0.80	0.025	0.025	0.20/0.35	1.65/2.00	0.70/0.90	0.23/0.30	—	—	—	
A 4608	A 4608	0.06/0.11	0.40max.	0.040	0.040	0.25max.	1.40/1.75	—	0.15/0.25	—	—	—	
A 4615	A 4615	0.13/0.18	0.45/0.65	0.040	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	—	4615	4615	
E 4617	E 4617	0.15/0.20	0.45/0.65	0.025	0.025	0.20/0.35	1.65/2.00	—	0.20/0.27	—	—	—	
A 4620	A 4620	0.17/0.22	0.45/0.65	0.040	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	—	4620	4620	
E 4620	E 4620	0.17/0.22	0.45/0.60	0.025	0.025	0.20/0.35	1.65/2.00	—	0.20/0.27	—	—	—	
A 4621	A 4621	0.18/0.23	0.70/0.90	0.040	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	—	—	—	
A 4640	—	0.38/0.43	0.60/0.80	0.040	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	—	4640	4640	
E 4640	E 4640	0.38/0.43	0.60/0.80	0.025	0.025	0.20/0.35	1.65/2.00	—	0.30/0.27	—	—	—	
A 4645	—	0.43/0.48	0.60/0.80	0.040	0.040	0.20/0.35	1.65/2.00	—	0.20/0.30	—	—	—	
A 4815	A 4815	0.13/0.18	0.40/0.60	0.040	0.040	0.20/0.35	3.25/3.75	—	0.20/0.30	—	4815	4815	
A 4820	A 4821	0.18/0.23	0.50/0.70	0.040	0.040	0.20/0.35	3.25/3.75	—	0.20/0.30	—	4820	4820	



to standard variations for check analyses.

Complete data on these standard steels may be obtained from the American Iron and Steel Institute, 350 Fifth Avenue, New York.

#### Notes on Tables

The ranges shown in the tables for open-hearth alloy and electric furnace alloy steels are restricted to sizes 100 sq. in. or less or equivalent cross-sectional area 18 in. wide or under with a maximum individual piece weight of 7000 lb., irrespective of sizes.

The lowest standard maximum phosphorus or sulphur content for acid open-hearth or acid electric furnace alloy steel is 0.05 per cent each.

The lowest standard minimum silicon content for acid open-hearth or acid electric furnace alloy steel is 0.15 per cent. •

For steels ordered to the above ranges, below the size and weight restrictions mentioned, the average of all the chemical checks must be within the limits specified subject to check analysis variations.

## Robots Guard Plant Fences

ROBOT sentries, small but far more efficient than men in fog, storm and darkness are helping guards keep watch along miles of high wire fences enclosing some of the country's great industrial plants.

The system, invented by a Du Pont Co. engineer, is now being manufactured for general use by Automatic Alarms, Inc., Youngstown, O. Its cost is said to be low enough so that even small plants may install it.

Operating on an undisclosed principle, the "acoustic fence" enables guards to hear what is taking place for blocks, or even for miles, along the fence line which it protects, and to tell instantly the location of any disturbance.

In addition to extending the hearing range of guards the robots provide an ever-alert checking-in system. Watchmen can use the fence line to report their positions or to summon help if necessary. Warnings may be received over a loud speaker system or they may be made to operate an alarm, recorded on a moving tape, or relayed to police or military headquarters.

## Open-Hearth Alloy and Electric Furnace Alloy Steels Subject to Standard Variations for Check Analyses

(Continued)

AISI Numbers		Chemical Composition Limits, Per Cent										SAE Numbers	
1942	1941	C	Mn	P	S	Si	Ni	Cr	Mo	V	1941	1942	
Chromium Steels													
A 5045	A 5045	0.43/0.48	0.70/0.90	0.040	0.040	0.20/0.35	—	0.55/0.75	—	—	—	—	
A 5120	A 5120	0.17/0.22	0.70/0.90	0.040	0.040	0.20/0.35	—	0.70/0.90	—	—	5120	5120	
A 5130	A 5130	0.28/0.33	0.70/0.90	0.040	0.040	0.20/0.35	—	0.80/1.10	—	—	—	—	
A 5140	—	0.38/0.43	0.70/0.90	0.040	0.040	0.20/0.35	—	0.70/0.90	—	—	5140	5140	
A 5145	A 5145	0.43/0.48	0.70/0.90	0.040	0.040	0.20/0.35	—	0.70/0.90	—	—	—	—	
A 5150	A 5152	0.48/0.55	0.70/0.90	0.040	0.040	0.20/0.35	—	0.70/0.90	—	—	5150	5150	
A 5152	A 5150	0.45/0.55	0.70/0.90	0.040	0.040	0.20/0.35	—	0.90/1.20	—	—	—	—	
Chromium Steels													
E 52095	E 52095	0.90/1.00	*0.30/0.50	0.025	0.025	0.20/0.35	—	0.45/0.65	—	—	—	—	
E 52098	E 52098	0.90/1.05	*0.30/0.50	0.025	0.025	0.20/0.35	—	1.00/1.25	—	—	—	—	
E 52099	E 52099	0.90/1.05	*0.30/0.50	0.025	0.025	0.20/0.35	—	1.30/1.65	—	—	—	—	
E 52100	E 52100	0.95/1.10	*0.30/0.50	0.025	0.025	0.20/0.35	—	1.20/1.50	—	—	52100	52100**	
E 52101	E 52101	0.95/1.10	*0.30/0.50	0.025	0.025	0.20/0.35	—	1.30/1.65	—	—	—	—	
E 52107	E 52107	1.00/1.15	*0.30/0.50	0.025	0.025	0.20/0.35	—	1.35/1.65	—	—	—	—	
Chromium Vanadium Steels													
A 6120	A 6120	0.17/0.22	0.70/0.90	0.040	0.040	0.20/0.35	—	0.70/0.90	—	0.10 Min.	—	—	
A 6145	—	0.43/0.48	0.70/0.90	0.040	0.040	0.20/0.35	—	0.80/1.10	—	0.15 Min.	—	—	
—	—	0.48/0.55	0.65/0.90	0.040	0.040	0.20/0.35	—	0.80/1.10	—	0.15 Min.	6150	6150	
E 6150	E 6150	0.47/0.53	0.70/0.90	0.025	0.025	0.20/0.35	—	0.80/1.10	—	0.15 Min.	—	—	
A 6152	A 6152	0.48/0.55	0.70/0.90	0.040	0.040	0.20/0.35	—	0.80/1.10	—	0.10 Min.	—	—	
National Emergency Standard Steels (New Series)													
NE 8024	—	0.22/0.28	1.00/1.30	0.040	0.040	0.20/0.35	—	—	0.10/0.20	—	—	—	
NE 8124	—	0.22/0.28	1.30/1.60	0.040	0.040	0.20/0.35	—	—	0.25/0.35	—	—	—	
NE 8233	—	0.30/0.36	1.30/1.60	0.040	0.040	0.20/0.35	—	—	0.10/0.20	—	—	—	
NE 8245	—	0.42/0.49	1.30/1.60	0.040	0.040	0.20/0.35	—	—	0.10/0.20	—	—	—	
NE 8339	—	0.35/0.42	1.30/1.60	0.040	0.040	0.20/0.35	—	—	0.20/0.30	—	—	—	
NE 8442	—	0.38/0.45	1.30/1.60	0.040	0.040	0.20/0.35	—	—	0.30/0.40	—	—	—	
NE 8447	—	0.43/0.50	1.30/1.60	0.040	0.040	0.20/0.35	—	—	0.30/0.40	—	—	—	
NE 8547	—	0.43/0.50	1.30/1.60	0.040	0.040	0.20/0.35	—	—	0.40/0.60	—	—	—	
NE 8620	—	0.18/0.23	0.70/0.95	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.15/0.25	—	—	—	
NE 8630	—	0.27/0.33	0.70/0.95	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.15/0.25	—	—	—	
NE 8724	—	0.22/0.28	0.70/0.95	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30	—	—	—	
NE 8739	—	0.35/0.42	0.75/1.00	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30	—	—	—	
NE 8744	—	0.40/0.47	0.75/1.00	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30	—	—	—	
NE 8749	—	0.45/0.52	0.75/1.00	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30	—	—	—	
NE 8817	—	0.15/0.20	0.70/0.95	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.30/0.40	—	—	—	
NE 8949	—	0.45/0.52	1.00/1.30	0.040	0.040	0.20/0.35	0.40/0.60	0.40/0.60	0.30/0.40	—	—	—	
Silicon Manganese Steels													
A 9255	A 9255	0.50/0.60	0.70/0.90	0.040	0.040	1.80/2.20	—	—	—	—	—	—	
A 9260	A 9260	0.55/0.65	0.70/0.90	0.040	0.040	1.80/2.20	—	—	—	—	9260	9260	
A 9262	A 9262	0.55/0.65	0.70/0.90	0.040	0.040	1.80/2.20	—	—	—	—	—	—	
A 9263	A 9263	0.55/0.65	0.70/0.90	0.040	0.040	1.80/2.20	—	—	—	—	—	—	

\* These steels may be specified to either 0.30 to 0.45 per cent or 0.35 to 0.50 per cent manganese, but it is recommended that the full range be allowed wherever possible.

\*\* Electric furnace.

## Watthour Meters in Electroplating

WATTHOUR meters have replaced ampere-hour meters at the Westinghouse Newark works for controlling the current used in electroplating permanent magnets. They cost less than ampere-hour meters, need not be located directly at the tanks, and eliminate the need for expensive and cumbersome shunts across the plating electrodes.

The watthour meter is connected to the a.c. side of the rectifier used to supply d.c. to the electroplating

tank. Since the a.c. voltage is substantially constant, the number of ampere-hours of the output rectifier will be proportional to the energy consumed, and no special ampere-hour meter or timer is necessary to secure accurate results. When the register on the watthour meter reaches a point corresponding to a previously determined plate thickness it trips a switch, operating a circuit breaker to interrupt the plating current.

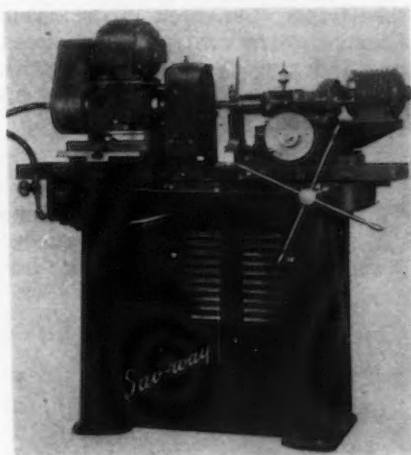
# New Equipment . . .

## Machine Tools

The tool room and production equipment shown on these pages indicates the progress of the machine tool industry in developing new designs and improvements to step up America's war production.

**H**ILL ACME CO., Cleveland, offers a line of hydraulic precision surface grinders in both horizontal and vertical spindle designs. Standard table sizes are 18, 24 and 30 in. wide and 5 to 20 ft. long. The main drive motor is built integrally with a dynamically balanced spindle. The reciprocating table drive is hydraulic, operating on low pressure with variable table speeds of from 10 to 100 ft. per min. Rapid traverse is provided for raising and lowering the wheel head with hand controls for final adjustments. The cross feed of the horizontal spindle grinder is also fully hydraulic and can be set for constant feed or for jump feed at each reversal of the table. The spindle head can be manually operated or locked in place for form or contour grinding. A system of double pumps provides separate and independent operation of the table and cross feed, and permits dressing of the wheel by power.

**F**OR tool room or production grinding of internal diameters from  $\frac{1}{4}$  to 18 in. to a maximum depth of 9 in. *Sav-Way Tool &*

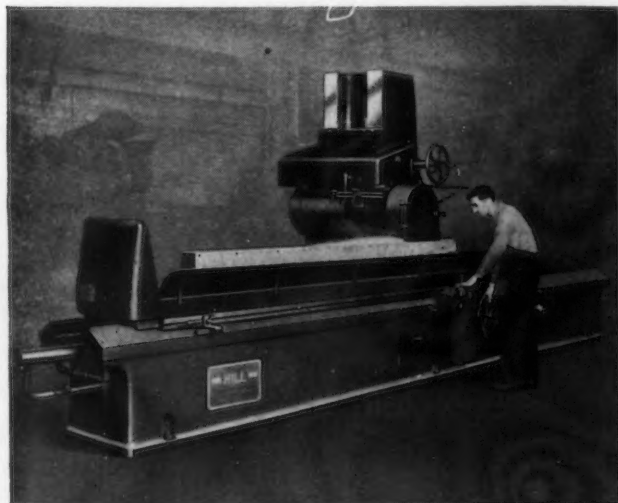


*Machining Co., Detroit, announces a new internal grinder. To increase flexibility it is constructed so that loosening two nuts permits the headstock to be moved a distance of  $3\frac{1}{2}$  in. at right angles to the wheel traverse. This allows the grinding of angles which can not be reached either by rotation of the headstock or traverse of the wheel. A compensating worm device disengageable for rapid traverse, adjusts the head to within 0.0001 in. The*

diamond holder is of swing type with micrometer adjustment.

### Dust Collecting Grinder

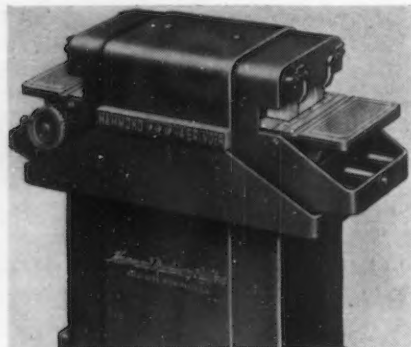
**M**AKING use of what was formerly waste space, *Hammond Machinery Builders*, Kalamazoo, Mich., have incorporated a dust collector in their new line of Hammond "OK" grinders. A small built-in motor draws air from the area around the wheels, and forces it through ducts in the base where the heavier particles are deposited in a compartment while the lighter particles and air are driven out through filters. The filters are of fiber glass, mounted in a frame for easy removal or replacement. It is claimed that they need not be replaced as frequently as filters on dust collectors in which all the grinding particles are collected by the filters alone.





### Carbide Tool Grinder

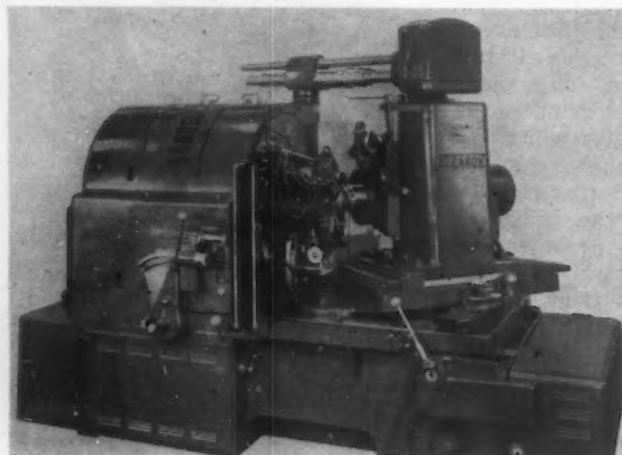
THE 14-in. carbide tool grinder introduced by *Hammond Machinery Builders*, Kalamazoo, is supplied in two models, cup wheels on both sides or cup wheel on one side and straight wheel on the other. Both types are for either wet or dry grinding. The mechanically controlled tables can be moved



through an arc of 45 deg. by means of a graduated handwheel, and movement of the table, with its hood and sludge pan, into or out from the wheel is also effected by a crank. Table surfaces are grooved and the edges nearest the wheels are fitted with replaceable steel wearing strips. A new compound protractor tool gage has been developed for use on the table. Providing angles from 0 to 90 deg., it slides in the table slot and toward or away from the wheel. The grinder is powered by a 3 hp. reversing motor with V-belt drive, giving a spindle speed of 1350 r.p.m. and a wheel speed of 5000 surface ft. per min.

### Hypoid Grinder

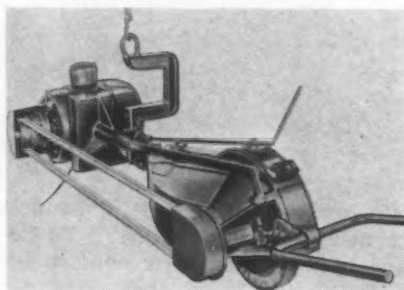
WITH the No. 17 Hypoid Grinder recently announced by *Gleason Works*, Rochester, N. Y., the teeth of generated curved-tooth, bevel and hypoid gears and pinions



are finished by precision grinding faster than by cutting. The generating motion combines continuous rotation of the work spindle with a reciprocating motion of the wheel carrying cradle. It is claimed that this gives grinding speeds heretofore unobtainable in a generating grinder. Wheel side, end and radius dressing is automatically performed by operation of a single hydraulic control lever. In grinding a gear the cup-type grinding wheel is alternately fed to the work during the up-roll of the cradle and withdrawn on the down-roll. The work rotates continuously so that the wheel engages a following tooth on the next up-roll. Hydraulic movement of the sliding base to and from cutting position, and a new type hydraulic chuck make for speed and ease in changing the work. Control of tooth bearing is obtained by dressing the wheel to a modified shape and by modifying the generating roll. Change gears control wheel speed and indexing from tooth to tooth while cams control feed and generating roll.

### Swing Frame Grinder

THE Marschke swing frame grinder built by *Vonnegut Moulder Corp.*, Indianapolis, has

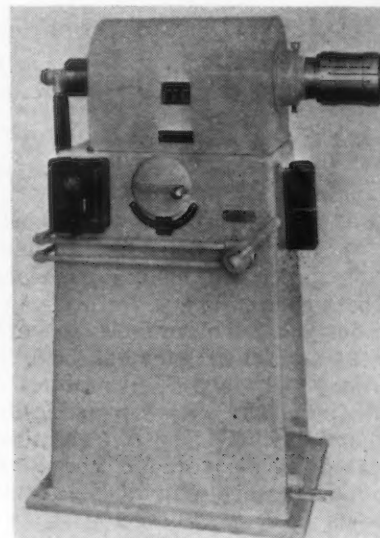


been redesigned to simplify belt changing to control wheel speed and thereby encourage operation of wheels at their safest and most efficient speed. Retained in the new model is the automatic spark shield adjustment which obliges the operator to change belts when replacing a worn wheel with a new one to eliminate the possibility of overspeeding the new wheel. Particular atten-

tion has been given to balancing the grinder and to provision for rapid adjustment for angle and contour grinding work.

### Engine Barrel Polisher

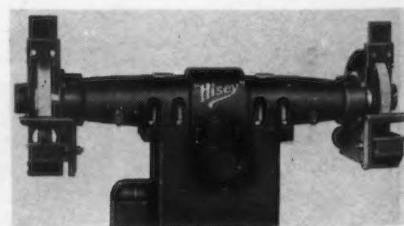
DESIGNED for polishing and finishing engine barrels on aircraft engines, a new type variable speed lathe, equipped with an air operated expanding mandrel



for holding the work, has been developed by the *Schauer Machine Co.*, Cincinnati. This type lathe can be supplied with single or two-speed motor, allowing an infinite selection of spindle speeds between 25 and 4000 r.p.m., in a ratio of 5½ to 1 with a single speed, and 11 to 1 with a two-speed motor. The lathe can also be supplied with a three or four jaw chuck, or a special holding device to meet individual requirements.

### Wide Swing Grinder

DESIGNED for grinding large irregularly shaped pieces and awkward parts, a wide swing grinder is offered by *Hisey-Wolf Machine Co.*, Cincinnati. Wheel guards may be set at any angle and are

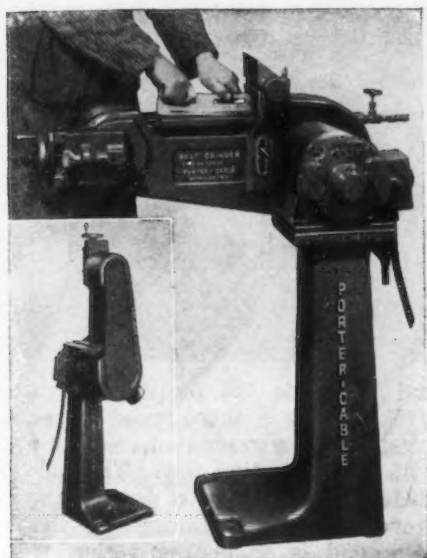


fitted with hinged covers and standard exhaust connections. Spindle speeds of 1300 to 2525

r.p.m. are provided by 3 and 5 hp. motors driving through double V-belts.

#### Belt Grinder

AS an addition to its line of wet and dry abrasive belt grinders, the *Porter-Cable Machine Co.*, Syracuse, N. Y., has developed a small unit which uses a belt 4 in. wide by 45 in. in circumference. It is equipped either for dry belts or for



the new resin bonded abrasive belts which use water or other coolants. A  $\frac{3}{4}$  hp., 1725 r.p.m., totally enclosed ball bearing motor direct connected to the drive pulley of the grinder gives a belt speed of 3400 surface ft. per min. Position changes of the belt from vertical to horizontal can quickly be made by removing three bolts. The slotted rest table is adjustable up to a 45 deg. angle.

#### Tap Reconditioner

**D**ETROIT TAP & TOOL CO., Detroit, announces a new tap reconditioning tool which combines in one unit facilities for chamfering, spiral pointing and point polishing. The tap chamfering unit, located at the left of the machine is of the precision collet type for accuracy of locating with quick changes. It will accommodate collets from the smallest machine screw size up to the  $1\frac{1}{4}$ -in. standard tap shank size. Taps of from 2 to 7 flutes may be handled through the provision of an indexing drum. Graduations are provided for adjustment to desired chamfering angle, and safety stop pins limit



the movement of the chamfering unit for taps of different numbers of flutes. A manual type diamond dresser is provided for the chamfering wheel and a hand wheel adjustment compensates for wheel wear. The spiral pointing unit to the right employs a saucer type wheel and its fixture accommodates taps up to  $\frac{1}{2}$ -in. thread diameter, using the same chuck. Taps of 2, 3 or 4 flutes may be spiral ground by setting the unit according to graduations on the support housing. A separate polishing unit fitted with a cone shaped wheel for spiral points and similar work is built into the machine and is driven by a separate motor.

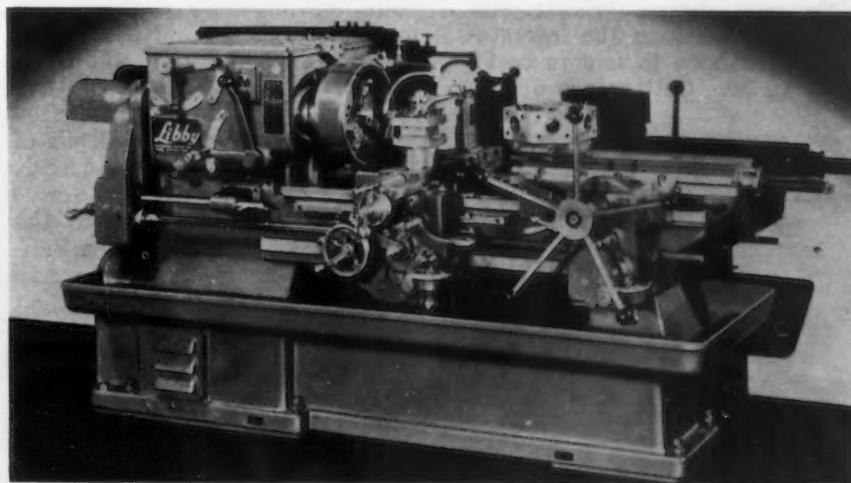
#### Ram Type Turret Lathe

**A**NO. 4 universal ram type turret lathe with 2-in. diameter collet chuck capacity, 22-in. turning length, and 20-in. swing is announced by *International Machine Tool Corp.*, Libby Division,

Indianapolis. The machine is supplied with tools for both bar and chucking work and will accommodate 8, 10, and 12-in. diameter chucks. Spindle control is obtained by a single lever, operating a double multiple disk main drive clutch. The all-g geared headstock provides 12 spindle speeds controlled by levers mounted on the front of the headstock. The universal carriage has six reversible cross and longitudinal feeds which operate independently of the hexagon turret carriage. Feeds are engaged by individual levers that operate friction type clutches. Quick acting levers disengage the feed either manually or automatically, and feeding is accomplished by a rack and pinion mounted on the bed. The hexagon turret ram slide carriage is provided with six power feeds to the ram slide in the forward direction. Motors of 5 or  $7\frac{1}{2}$  hp. are furnished, depending on the work to be handled.

#### Swiss Type Automatic

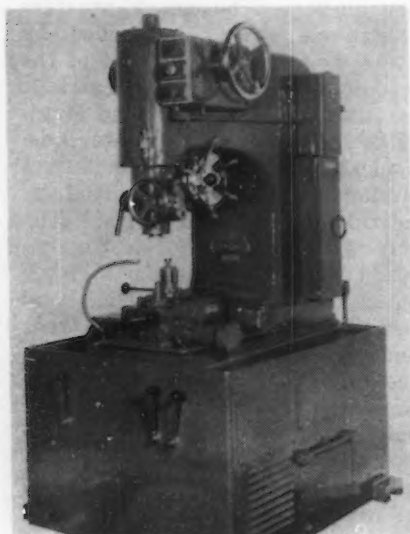
**S**TRIKERS pins, detonators, and fuse pinions are among the armament items said to lend themselves particularly well to production on the high speed precision automatic introduced by *Wickman Corp.*, Detroit. Its principal features are a sliding headstock and a tool head that carries five tools that work radially. Cams control headstock and tool movements to produce any angle or form without the use of form tools, and many parts, even those incorporating a pivot point, can be finished in the cut-off, thereby eliminating the need for second operations.





### Semi-Automatic Miller

**C**LEARANCES for articulated connecting rods are milled in the master rods used in radial aircraft engines on this semi-automatic milling machine designed and



built by *Snyder Tool & Engineering Co., Detroit*. The unit will handle either solid or split type rods, performing roughing and finishing operations. Since the cutting cycle of the machine is automatic, being hydraulically operated and electrically controlled, it is said that a single operator can maintain continuous production on several of these units.

### Gun Barrel Miller

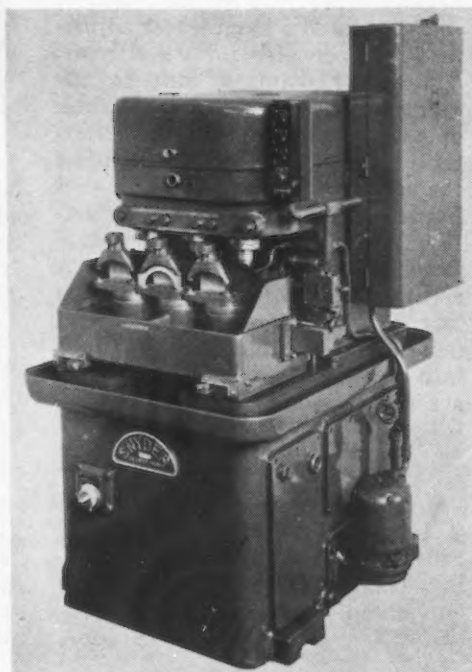
**A** NEW milling and centering machine for use on machine gun barrels has been developed by *Davis & Thompson Co., Milwaukee*. It mills the barrels to length, centers them, takes a rough cut at one station, indexes, takes a finish cut at the next station, indexes, and drives the center on the last station. Production is said to be 80 pieces an hr. Cutters are 6¼-in.



in diameter and spindles have 1½ in. manual adjustment for length. The center drill is equipped with Scully-Jones drill holders to give 1-in. adjustments to the drill spindle.

### Contour Milling Machine

**A** NEW semi-automatic milling machine designed by *Snyder Tool & Engineering Co., Detroit*, for radius contour milling the bolt bosses on connecting rod caps, features three spindles and three revolving fixtures, for machining three parts at a time. The spindles are quill type, driven by V-belts, and have quill clamps and vertical adjustment to compensate for tool wear. Three parts are loaded on locating pins, in drilled and reamed

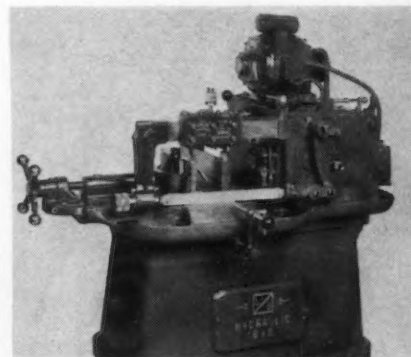


holes, and manually clamped. The machine cycle is automatic. As spindles start rotating, the main slide moves forward to the cutters and trips into feed until full depth of cut is reached. Then the cross slide revolves the fixtures in a half-circle on the centerline of the bolt holes, to mill the radius contour around the bolt bosses. When the cut is complete, the main slide returns to starting

position and the cross slide revolves the fixtures back to loading position. The operator reverses the parts in the fixtures and the machine then repeats its cycle to mill the other boss on each part.

### Hydraulic Saw

**O**N the West Coast the *L. B. Mfg. Co., Los Angeles*, has developed a horizontal saw with a maximum capacity of 6x6 in. bar stock. Employing hydraulic feed



and hydraulic lift on the return stroke, it has a three speed transmission and a graduated vise with a 45 deg. swiveling jaw. The saw blade is protected by a device that prevents it from falling on the work and is so arranged that it rises hydraulically to its highest point upon completion of each cut. A built-in coolant pump is synchronized with the blade motion.

### Band Saw

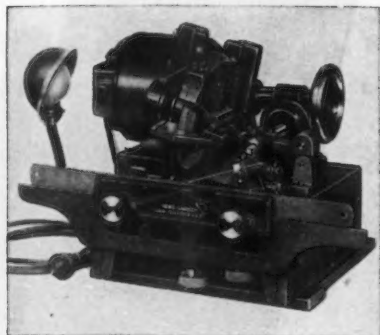
**T**HE new band saw manufactured by *Johnson Machine Works, Albion, Mich.*, has a capacity of 10-in. rounds or 18-in. flats with four speeds, obtained by adjustment of the V-belt drive. Powered by a ½ hp. motor it has a box type frame and wide guide rolls which support the entire blade. The bolt action stock stop recedes during cutting to allow the cut portion of the work to fall clear and prevent damage to the blade. Feed is hydraulic and controls are centralized within easy reach of the operator.



## NEW EQUIPMENT

### Automatic Saw Sharpener

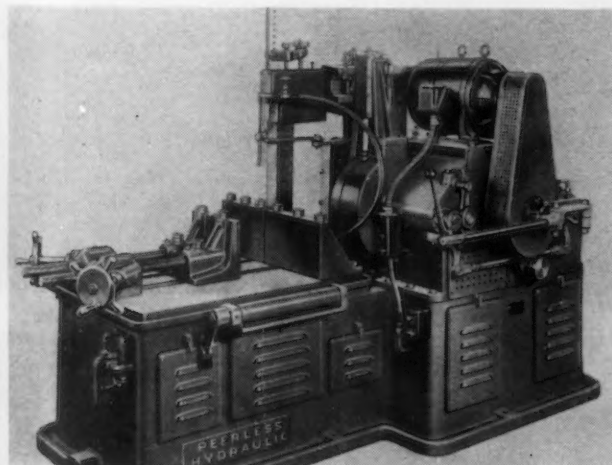
FOR sharpening blades of hack and band saws, metal slitting and circular rip saws, a fully automatic machine has just been developed by *Howe & Son*, Hinsdale, N. H. The new unit, known as the Howe-Lindsay saw sharpener, is said to be capable of reconditioning a 19-ft. band saw in 40 min. It



will handle hack or band saws of any size and circular rip or metal saws up to 20-in. diameter. Running at a speed of 83 teeth per min. and driven by a  $\frac{1}{4}$  hp. motor, its operation is automatic once the set up for a given blade is made.

### Vertical Power Hack Saw

IMPROVEMENTS in the heavy duty vertical-cutting power saw manufactured by *Peerless Machine Co.*, Racine, Wis., now provide for cutting tool steel up to 24 in. long and 10 in. deep without turning the work. The elevating stock rollers built into the sides of the work table, as well as the saw blade feed pressure, are hydraulically controlled. Using saw blades from 14 to 34 in. long, the machine has speeds of 50, 85, and 125 strokes per min. The blade is vertically driven by a 5 hp., 1800 r.p.m. motor



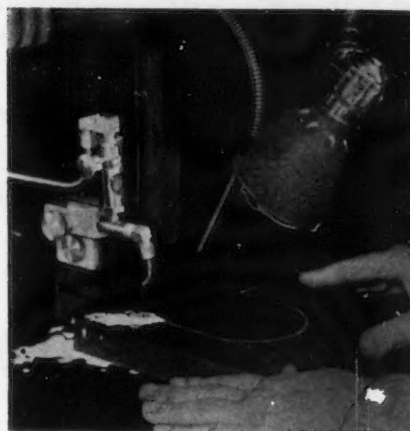
through five V-belts, and a hydraulic balancing cylinder is used to offset the weight of the saw frame in its reciprocating motion.

### Tapping Machine

FOR precision tapping, *Pacific Tool & Specialties Co.*, Los Angeles, offers a new machine to handle diameters to  $\frac{3}{8}$  in. Taps are guided by easily replaceable precision leads. The machine employs a full floating spindle, is equipped with a dial indicator for bottom tapping, has four speeds, and is fitted with precision ball bearings throughout.

### Band Saw Lubricator

TO improve efficiency of Doall machines a new lubricating attachment for supplying coolant to

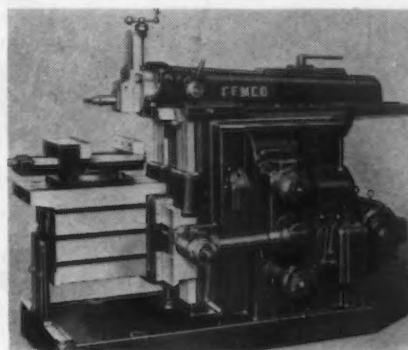


the saw blade has been introduced by *Continental Machines, Inc.*, Minneapolis. Tests have shown that, with the proper coolant, the device may be expected to prolong saw life by as much as 25 per cent and increase cutting speeds by an average of 10 per cent. In addition

a better finish is obtained. The new attachment fastens directly on the post above the saw guide on the Doall machine and a flexible feed line directs the coolant to the correct position. Kerosene, light cutting oil, soluble oil and carbon tetrachloride are used as coolants, depending upon the material being cut.

### Crank Shaper

A NEW development in the construction of crank shapers is announced by *General Engineering & Mfg. Co.*, St. Louis. Among the



new features are independent power rapid traverse to the table, force feed lubrication of main bearing and all sliding surfaces, and a safety interlock which prevents starting of the ram without sufficient pressure in the lubricating system. The shapers are built in 16 and 20-in. stroke lengths, operate at speeds of from 10 to 140 strokes per min., with eight cutting speeds and 18 feeds ranging from 0.010 to 0.180 in.

### Portable Shaper

AVAILABLE for stationary installation, or mounted on a portable cabinet, a 7-in. shaper is offered by *Automotive Maintenance Machinery Co.*, North Chicago. Ways of the ram, tool head and front face of the main frame are V type. The vise is of semi-steel with steel jaw inserts. Feeds of from 0.003 to 0.018 in. are obtainable on the reversible adjustable type feed mechanism.







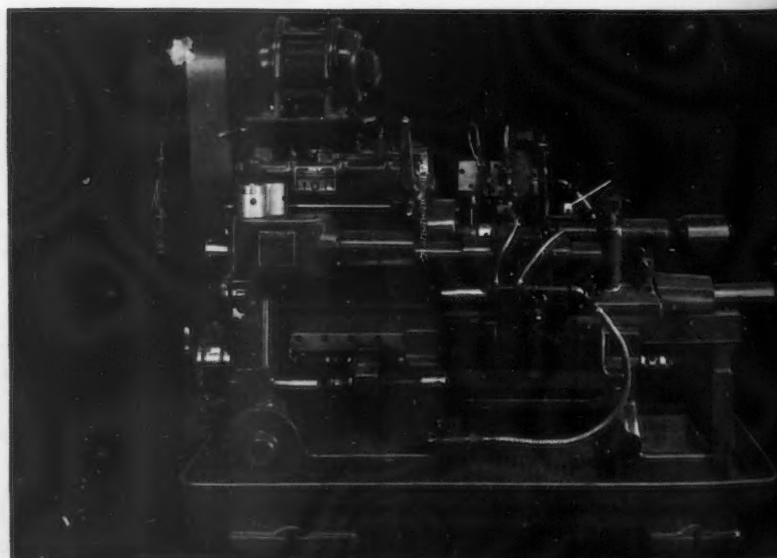
# Every modern soldier



**B**y the end of 1863, complaints from infantry in the field kept coming to Colonel Benton at the Springfield Armory. Cartridges dipped in tallow gathered grit, scoring rifle barrels, causing locks to jam in emergencies. Could the ordnance department find a way to lubricate bullets without covering the whole cartridge with sticky grease? The answer came from Albert Ball of Jones & Lamson. He produced predecessors of Jones & Lamson. He produced a machine which put grooves in the bullets. The bullets were greased in these grooves, and the grooves covered by the end of the shell when loaded. Ever since then, service cartridges have been dry, and the bullets lubricated by grease in grooves which are not exposed until the cartridge is fired.

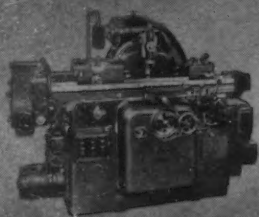
## JONES & L

*Manufacturers of Ram & Saddle Type  
Universal Turret Lathes . . . Fay Auto-  
matic Lathes . . . Automatic Thread  
Grinding Machines . . . Comparators  
. . . Automatic Opening Threading  
Dies and Chasers*

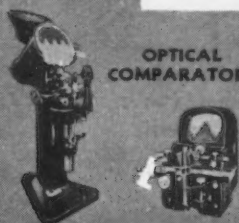


Jones & Lamson 12" Fay Automatic Lathe tooled to face groove and cam turn automobile pistons.

AUTOMATIC THREAD  
GRINDERS



OPTICAL  
COMPARATORS



RAM TYPE  
UNIVERSAL TURRET LATHE



# *owes a debt to* **ALBERT BALL**

**A**LBERT BALL'S solution of Colonel Benton's problem was neither the first nor the last of hundreds of such problems overcome by Jones & Lamson engineers and by their predecessors.

Ever since 1833, in the early shops at Windsor, and since 1888 in factories still expanding at Springfield, generation after generation of machine builders has been working in continuous succession. Through more than a century they built up an accumulation of knowledge that forms a background for the rapid, far-reaching developments that characterize the work of Jones & Lamson engineers.

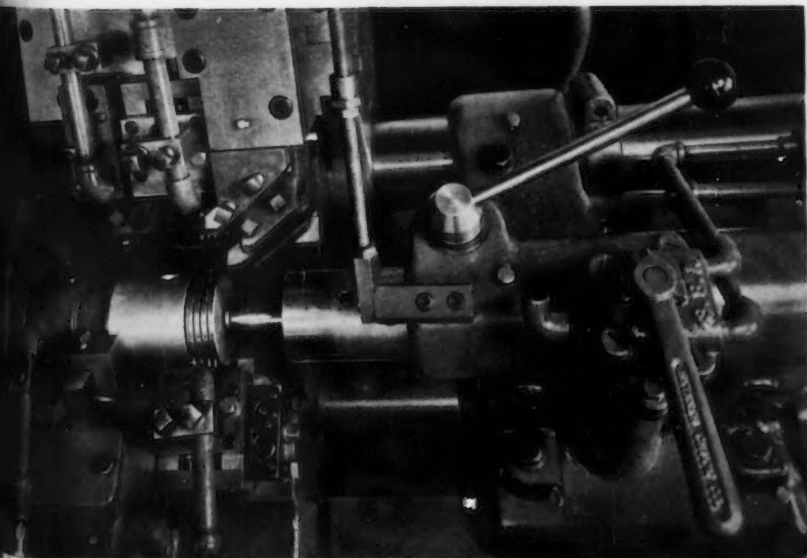
Thus today, Jones & Lamson engineers are

called upon in turn to design and equip whole new factories for mass production—or to take the kinks out of a single job like the one pictured here.

Time is saved by cam turning while facing and grooving pistons on the Fay Automatic Lathe—grinding time is reduced to a minimum.

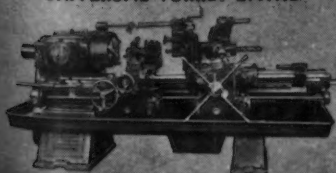
Whether your plant is large or small, your production problem big or little, it pays to write for help to Jones & Lamson engineers. With Jones & Lamson equipment you can meet today's wartime demands and still be ready for the hard years ahead. Illustrated catalogs are available.

## **JONES & LAMSON MACHINE COMPANY** SPRINGFIELD, VT., U. S. A.

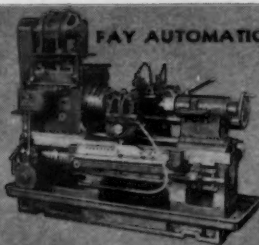


Close view of tooling on a Jones & Lamson 12" Fay Automatic Lathe tooled to face, groove and cam turn automobile pistons.

SADDLE TYPE  
UNIVERSAL TURRET LATHE



FAY AUTOMATIC LATHES



AUTOMATIC OPENING  
DIE HEADS

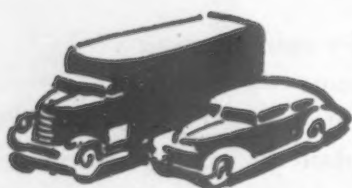


PROFIT PRODUCING  
MACHINE TOOLS



# Assembly Line . . .

• Walter Reuther demonstrates unclear thinking in plan discussion with C. E. Wilson . . . Parts quota dissection developing, with rationing possible . . . Tank picture better . . . Materials problems prove worry to all producers.



**D**ETROIT — The celebrated Reuther plan discussion, staged between Walter Reuther of the UAW-CIO and President C. E. Wilson of General Motors, has produced a variety of reactions.

Some newspapers adopted the cautious line of rejoicing that both men had found a common goal—winning the war. Others were more callous in remarking that the day's analysis ended in a deadlock. Some other outlets explored the reasons for the "deadlock" and developed the underlying truth that Mr. Wilson was citing facts, Mr. Reuther was citing principles, and that a meeting ground between the concrete and the abstract is most difficult to recognize.

This discussion was not a debate for the simple reason that there was too much discussion. Neither side could have followed a line of facts to an inevitable conclusion for several reasons. There were time limits on the remarks, followed by comment from the "opponent," then rebuttal and often re-rebuttal, during which the thinking frequently strayed far afield. And intermingled with such meanderings were long speeches from the reporters' benches, by newsmen who evidently felt they were miscast and wanted to participate in the oratory themselves.

In all fairness, it must be said that much light was shed on a variety of problems during this conference. In fairness, too, it

must be said that Mr. Wilson stuck to the line of discussion most often, and Mr. Reuther did not. Mr. Reuther failed to present any solidly-grounded thesis, except that his plan called for the use of spare equipment for productive purposes—hardly a revelation at any time. Beyond that, a great deal of his planning appeared to trail off into uncertain ends which could only be solved, in an actual commission of his plan, by one planning board superimposed on another. And what a job of planning those boards would have to do!

**F**ROM page C-103 of the 173-page transcript: ". . . there would be a department that would know how many boring mills were available (throughout the entire auto industry) on a Monday morning, what they were scheduled to do for the week; and if Ford had boring mill work they could not handle in their shop and General Motors had extra boring mill capacity, Ford would take that work into General Motors, or if the opposite were true, General Motors would take it into Ford's. In other words, this central tooling agency would have its fingers on every machine every hour of the week and know what was happening."

This is a gargantuan job, and there are many others of similarly imposing stature. But the concept of the program itself is not bolstered with true facts. Early in the meeting, Mr. Reuther declared (Transcript Page C-15): ". . . we made a check as recently as last Saturday in the Ford Pratt & Whitney plant . . . our contention is that 85 per cent of the machines are still the same machines, and can be converted by re-tooling."

What was meant was that the machines used for a certain job were converted from automotive production tools or could have been; and from the personal observation of the writer, this is fabrication. Machine tool builders who have gone through the plant and seen the vast reaches of required machinery will echo this thought. As Mr. Wilson remarked hopelessly quite early in the day:

"I don't know what to do about it, when a man won't look at the facts."

**T**HE General Motors president brought out some extremely relevant material in his remarks. Some of it was shown in tabular form—a comparison of machine tools used on Cadillac and Allison engines for crankshaft, camshaft, connecting rod, wrist pin and supercharger vane. Allison tool requirements were triple those of Cadillac and nearly five times as expensive. Of the 318 required machines, Cadillac was able to furnish 46 from its surplus and could have furnished 47 more if it had closed down completely.

More relevant facts: on one engine job, there were 4961 machines needed. Only 1047 used machines were found suitable. But this next fact may be the most lucid commentary on the claim that the Reuther plan, through all-out conversion, would have speeded arms output: two companies are building similar aviation motors. One followed a program which was primarily a new operation from the ground up—factory, tools, manpower. The other converted a motor assembly plant for the job, using the old building, the former manpower and all available machinery—not just spare machinery, as specified in the Reuther plan. The two jobs took almost exactly the same length of time, even though one program was not as large.

The Reuther plan was seriously jarred, if not entirely toppled, in this meeting. Mr. Wilson sought to "bury a corpse," as he put it, and any fair-minded observer at the rites would agree that the weight of facts was on his side. At any rate, the Reuther plan is unlikely to be airily characterized by labor henceforth as a blueprint for all conversion problems, for government planning, for maximum arms output and for an earlier start to it.

**M**EANWHILE, it is interesting to learn that at least four important sectors of the automobile industry have not been dismantled—on orders from Washington. Engine lines of four companies have been retained, held in reserve for contingencies. These contingencies have to do with possible war work more than with civilian man-



# THE WAY TO WIN A WAR!

To —  
Machine Propeller  
Hub Spider in 25½ min.  
Time Was . . 315 min.

The Mult-Au-Matic method is showing production time cuts like this on scores of parts where speed and accuracy are vital.

Use your Mult-Au-Matic to the utmost. We'll help you.

**BULLARD**

**THE BULLARD COMPANY**  
BRIDGEPORT, CONNECTICUT



ufacturing, but they put the retained production lines in a standby role for as long as they exist.

Of course, not all of the rest of the industry has been dismantled. A few companies might be able to start producing automobiles in comparatively short order, though the great majority could not. And parts production is still continuing, as

**Q**UOTAS on wheels and non-functional parts will likely be sharply cut down. Washington figures that nearly every motorist has a spare wheel in his car, making a tremendous national reserve. As for fenders and such parts, government opinion is that if they are unnecessary to keep the car run-

tanks, the first unit having been completed a month ago. When this plant and the Ford tank plant, now building, go into full operation they will double the automotive tank totals.

### Machine Tool Shipments Gain in February

••• Value of new machine tools, presses and other metal working machinery shipped during February was \$93,100,000, it was announced April 3 by George C. Brainard, chief of the WPB tools branch. Shipments of machine tools alone amounted to 20,307 units with a total value of \$84,355,000. During January 19,266 units, valued at \$83,546,794, were shipped.

"Production of new machine tools continues to go up month by month," Mr. Brainard said. "Compared with the same month of last year, the value of machine tools, presses and other metal working machinery shipped during February, 1942, represents an increase of 63 per cent.

"This achievement deserves commendation, but what is more important, it is an indication that the flow of critically needed machines from shops will continue to increase. We need every machine that can be built this year. We need all of the capacity of all of the shops working around the clock.

"However, we can count on only so many new machines during this year. While we are accelerating our program for the production of new machines, we are looking for most of our additional facilities to come from existing machines, whether they are idle or working on non-essential goods. Every day considerable numbers of such machines are being converted to war work and this rate will increase rapidly. Any machine that is needed for war work will be put to war work, and as quickly as possible."

### Lodge & Shipley Buys Property Cincinnati

••• Lodge & Shipley Machine Tool Co. purchased a group of industrial buildings in the western part of Cincinnati, last week, for anticipated expansion needs. The buildings contain 81,372 square feet of floor space.



**BUICK AIRPLANE ENGINES:** These bomber engines, built by Buick, are being disassembled for inspection following their first test run. The few "penalty runs" required attest the high quality of production, it is claimed.

authorized by the WPB quota orders earlier this year.

There is not the regularity in this parts production that had been expected, however. Output of replacement parts was allowed during the first six months of 1942, up to quantities 150 per cent of those turned out during the entire 1941 year. But the six-month limitation has already been extended in various cases; and the blanket order is expected to be broken down still further.

Cast iron and stamped parts are already reported built up to a two-year supply level. At the other end of the picture, stocks of certain parts, such as those requiring chromium, are at low ebb and unlikely to be built up in any degree, because of materials problems. And there are such replacement essentials as batteries, on which a stockpiling procedure is waste, pure and simple, because the batteries deteriorate rapidly during non-use.

ning, they are wasteful to produce today.

The unbalanced parts stock situation may lead to rationing of parts some time in the future. It is known here that Leon Henderson's staff at OPA is giving consideration to the development of a formula which will determine the essential uses of automobiles. Until such a formula is derived, obviously, parts rationing would be impractical, if not impossible. But if such a formula comes, rationing will not be far behind.

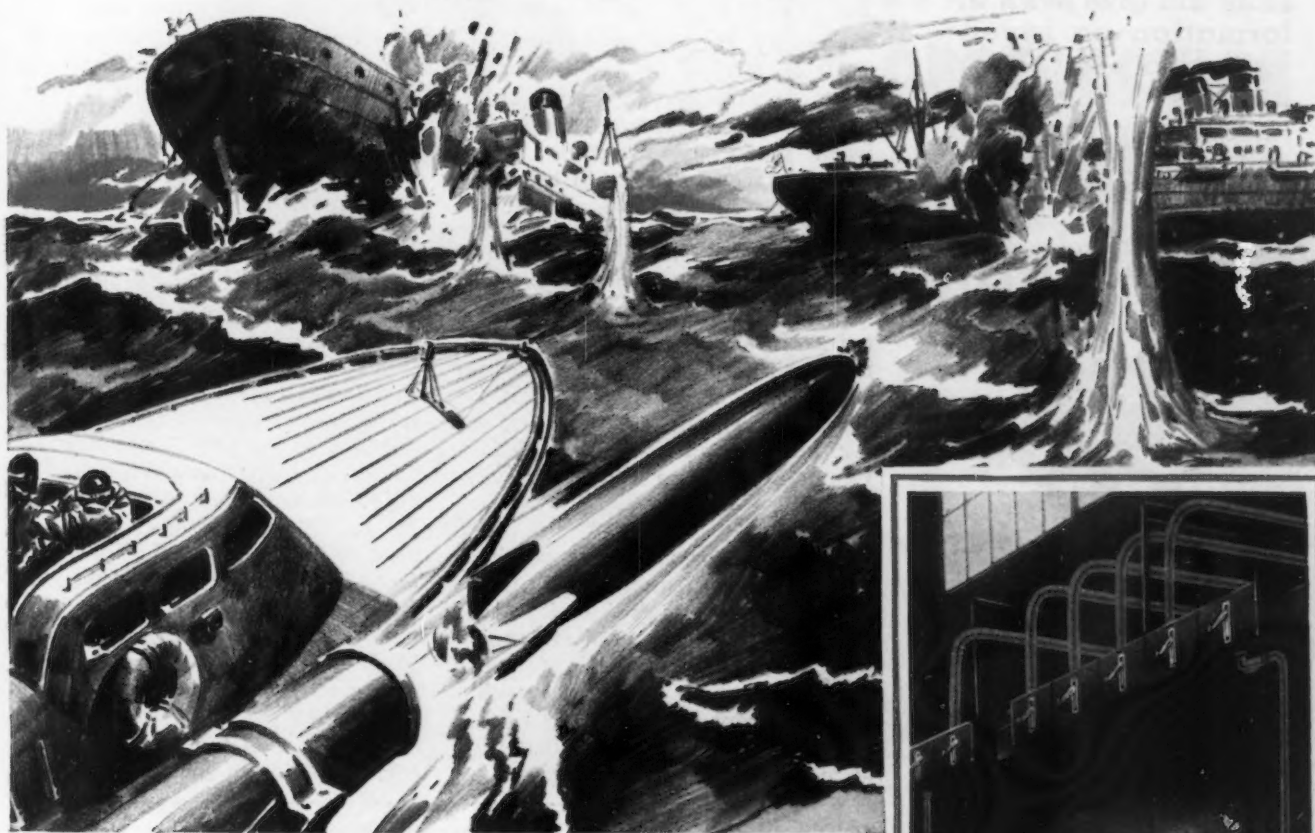
The parts situation stems from materials problems, and so do many of the worries of automotive armament producers today.

None of these impinges on the tank production program, and in this phase of the arms effort some light is beginning to break through after many months of slow progress.

Fisher Body Division, meanwhile, is in production line assembly of

# WHILE AMERICAN HEROES SLUG BACK

**American Industry Speeds Conversion  
with Bulldog "Plug-in" Light and Power**



**N**O one factor — no one type of equipment — is helping more to speed the conversion of American industry than Bulldog "Plug-in" Light and Power Distribution Systems.

For with Bulldog Bus Duct Systems there is no time lost getting power to new machines—no time lag and high labor cost changing old-fashioned wiring whenever a machine must be moved. A new machine or a new lighting unit can be plugged in at any time, or an old one moved to a new location, as simply and easily as you plug in an electrical device at home.

#### **Flexible, Movable, 100% Salvable**

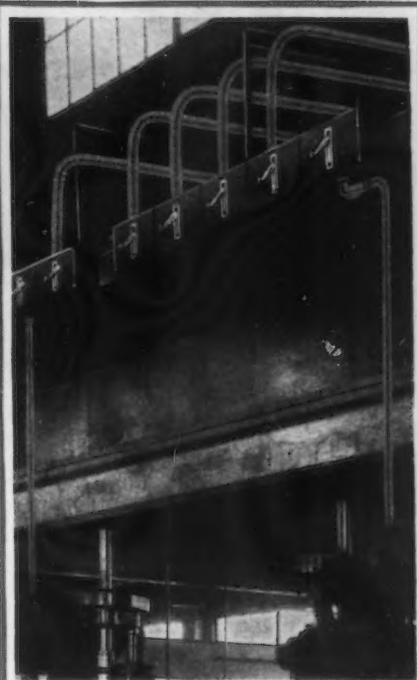
Industry has learned to rely on the timesaving and flexibility of Bulldog Systems — is using them more and more to speed conversion and production. Here, a new unit goes up, and the Bulldog System follows the roofers right in. There, a plant is stripped of its old machinery, and its Bulldog System permits the installation of new equipment quickly, easily and inexpensively. Or, an entire Bulldog Sys-

tem can be moved to a new location, with 100% salvability and minimum labor cost.

The complete Bulldog line includes three time and money-saving Bus Duct Systems. BUStrihution DUCT, for Power, takes power right to the individual machines. Industrial Trol-E-Duct, for Production Lines and Assembly Benches, furnishes mobile power and support for portable tools. Universal Trol-E-Duct, for Light, permits instant movability of lights or the addition of new ones in a few minutes.

#### **Bulldog Field Engineers Near You**

To learn how Bulldog Bus Duct Sys-



*This run of 750 ampere "Plug-in" Type Bulldog BUStrihution DUCT feeds motor and welder circuits in a large war production plant. Note individual protective plugs of various types for each machine.*

tems help speed production or conversion, write for complete descriptive bulletins. Bulldog Field Engineers, in more than thirty conveniently located branch offices, will advise with you about your light and power problems, or, if you wish, will save time for you, your architect and your contractor by taking right off your hands the whole job of designing a flexible electrical distribution system for you.

**BULLDOG**  
**ELECTRIC PRODUCTS CO.**

DETROIT, MICHIGAN  
Bulldog Electric Products of  
Canada, Ltd., Toronto, Ontario



**ORIGINATORS OF FLEXIBLE ELECTRICAL DISTRIBUTION SYSTEMS FOR LIGHT AND POWER**



# Washington . . .

• **New mandatory Production Requirements Plan will give WPB information on inventories and production facilities . . . Once tabulated, this information will be basis for assignment of preference ratings.**



**W**ASHINGTON — Under the Production Requirements Plan which WPB is going to make mandatory by the end of June in the priority assistance granted to all major users of material, a manufacturer's needs for war production are certified to him on Form PD-25A, revised, the application form under Preference Rating Order P-90. This means that most preference rating orders for particular industries will be allowed to expire, and new priority ratings will be assigned on the basis of information collected from Form PD-25A, on a quarterly basis.

The purpose of PRP is to give WPB information regarding a manufacturer's inventories and production facilities, to show to whom his sales are made, and from this information to enable WPB to analyze a producer's anticipated requirements and compare them with requested materials both critical and otherwise. Once tabulated, this information is the basis for the assignment of preference ratings with which a manufacturer may secure all of his material requirements.

**A** MANUFACTURER who applies for priority assistance under PRP will show the type and volume of the products he has been making, their use in relation to defense and essential civilian needs, the

amount of material he has in stock, and the additional amount he will require to fill his production schedule for the following calendar quarter.

Priority ratings assigned after PRP is put on an industry-wide basis may conceivably vary from quarter to quarter, but attempts toward uniformly assigning them without inconsistency will be made by WPB. Ratings are extendible by indorsement to suppliers for the materials granted to be physically incorporated into end products as well as for maintenance and repairs. However, capital equipment must still be applied for by means of PD-1-A. A simplified PRP is available for one-product plants, or for those firms whose annual dollar volume of business does not exceed \$100,000.

**W**HEN Form PD-25A reaches WPB it is received in a mail room, where it is first assigned a case number and routed either to the Production Requirements Branch or to an industry branch. If 75 per cent of a company's output is devoted to one product, the form is sent to the industry branch

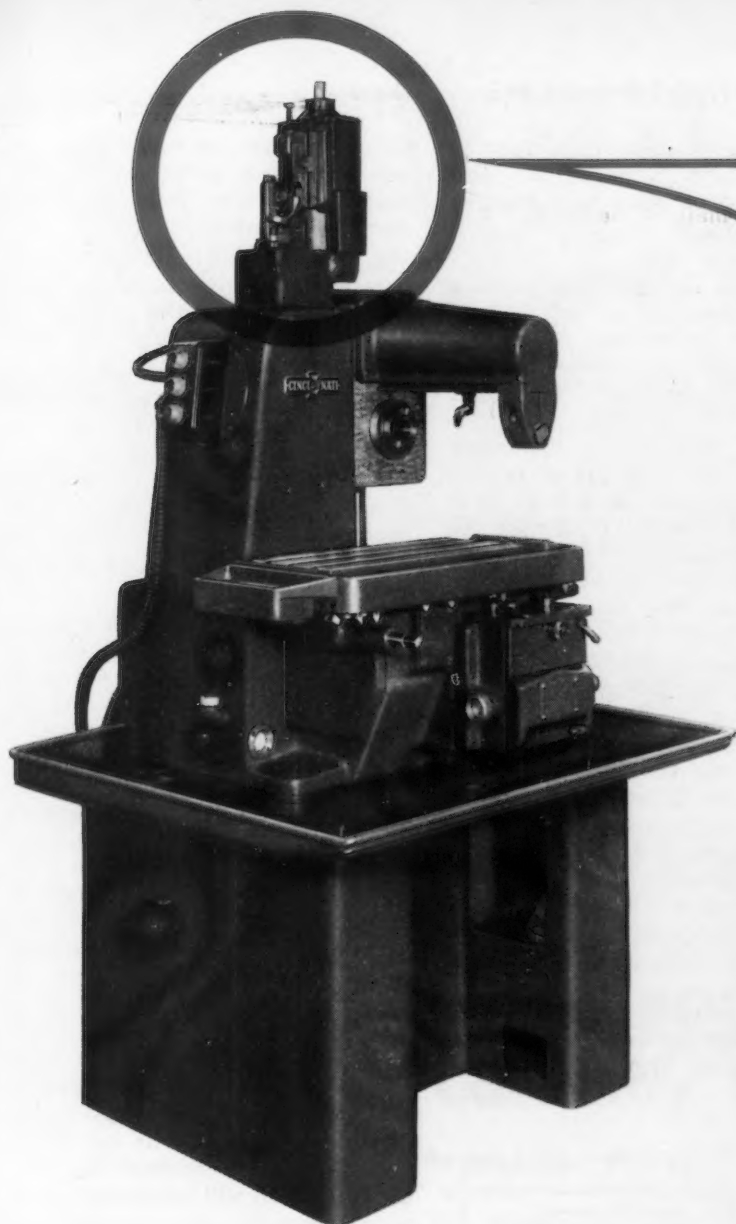
handling the product. Some industry branches are not set up to process the forms, and others do not want to be bothered with their handling. In the latter cases, and where the products are heterogeneous, the Production Requirements Branch takes over the job of clearing the application.

Procedures in both the industry branches and the Production Requirements Branch are parallel. An analyst receives the application and confers with the various materials men assigned to the particular product, and with other industry branch men interested. When the application has received due consideration, the analyst gives it tentative approval or denial. Thereafter the PD-25A is held in a pending file for three days, awaiting possible objection by other interested officials. If none is made, the case is sent to the branch chief for approval. His approval must be concurred in by the Procedure and Review Section. A report is then made to the materials division, which gets a second crack at the application before it is approved. Daily clearances with the materials division are made to clear the delivery

**FORD BOMBER PLANT:** Where a creek ran through Willow Run, west of Detroit, a year ago, there now stands the largest room ever built. Here, Ford Motor Co. will soon be turning out 24 four-engined, Consolidated bombers a day, and by December will employ 90,000. This tool shop occupies a tiny corner of the huge building.

*Acme Photo*





## IT TAKES THE OBSTRUCTION JUMPS *Automatically*



**A**N obstruction in the path of a milling cut brings these time-consuming manipulations to mind: Adjust table—raise knee to depth of cut—(mill)—lower knee—rapid traverse table to clear work of cutter. The CINCINNATI 0-8 Plain Automatic Miller, equipped with Automatic Rise and Fall Spindle Carrier, does all these things *automatically; quickly; far more accurately* than can be done by hand adjustments of the work to the cutter.

The 0-8 qualifications of closer accuracy and higher production than ever before, fit admirably into the production of the many intricate mechanisms required for both peace-time and war-time equipment. Brief specifications will be found in Sweet's Catalog File. More complete information may be obtained by writing to us for catalog M-964.



The illustration above, with the explanatory cycle diagram, shows a typical example of the type of job handled on the CINCINNATI 0-8 Plain Automatic Miller with Automatic Rise and Fall Spindle Carrier.



**CINCINNATI MILLING MACHINE CO. CINCINNATI, OHIO, U.S.A.**

**ROOM AND MANUFACTURING MILLING MACHINES... SURFACE BROACHING MACHINES... DIE SINKING MACHINES**



of materials which are under allocation.

**T**HE End Use Code, discussed in *THE IRON AGE* of March 26, will be attached to PD-25A beginning July 1, and will serve as the single report form to replace all others required by preference rating orders which will have expired by that time.

Information called for by the first page of the application relates to inventory, previous inventory, and withdrawal figures showing product classification, shipments by types of products, dollar value, ratings, and estimated shipments for the following quarter. The inventory report includes raw materials, work in process, finished goods, supplies, etc. Classification of shipments, and unfilled orders by dollar volume and rating as well as shipment to customers to show end use are required to be shown.

The second page requires exact detail respecting the quantity of material needs for the end product which are enumerated in Material List No. 1. Material List No. 1 is a comprehensive tabulation of critical materials.

Page three is a report of all other materials for which a preference

rating is requested. Page four is supplementary to pages two and three. PD-25A must be submitted in quintuplicate.

**W**HERE materials for which a preference rating is requested are to be used for orders carrying high preference ratings, such materials may be given special treatment in assigning ratings. The fourth page of the application is for this material, and permits a manufacturer to breakdown his total requirements in terms of classes of products.

An accompanying letter should be written to show needs for additional material wherever due to plant expansion, unbalanced inventories, etc. The letter should show for each item the total quantity on hand at the end of the preceding quarter of only those types or sizes for which no delivery during the next 90 days is required and the anticipated requirements for this period. It should be noted that materials for plant expansion cannot be secured through the use of PD-25A.

**A**PPPLICATIONS for materials governed by conservation orders, such as M-9-c for copper,

should request no more than the conservation order allows, but should show the following additional information:

1. Part in which material incorporated, product into which part enters, end use of the product, or purpose for which material is used.

2. Substitutions accomplished to date, amount of material saved per month compared with former consumption, further substitutions anticipated or reasons no substitutions can be made including specifications of Army or Navy.

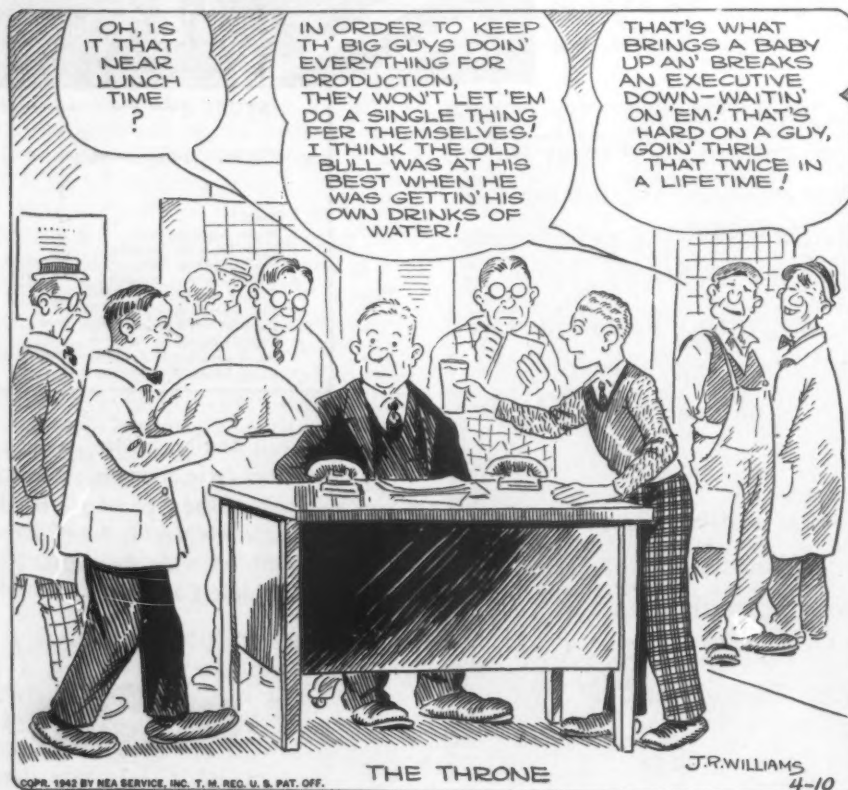
3. Form, grade, type, or alloy of material.

If the applicant gets his materials or supplies from affiliated central stores, warehouses, or other division or company which is under common control with the applicant, he should give in the accompanying letter, the name and address of such company, the materials customarily obtained from it and the relationship. Failure to make such a statement will constitute a representation that materials and supplies are not obtained from any such source. False statements are subject to criminal penalty.

Appeals for additional assistance during a quarter should be submitted on Form PD-25A and emergency assistance may be gotten by phone or telegraph. The expediting unit of the Production Requirements Branch will act on such communications the same day received.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS

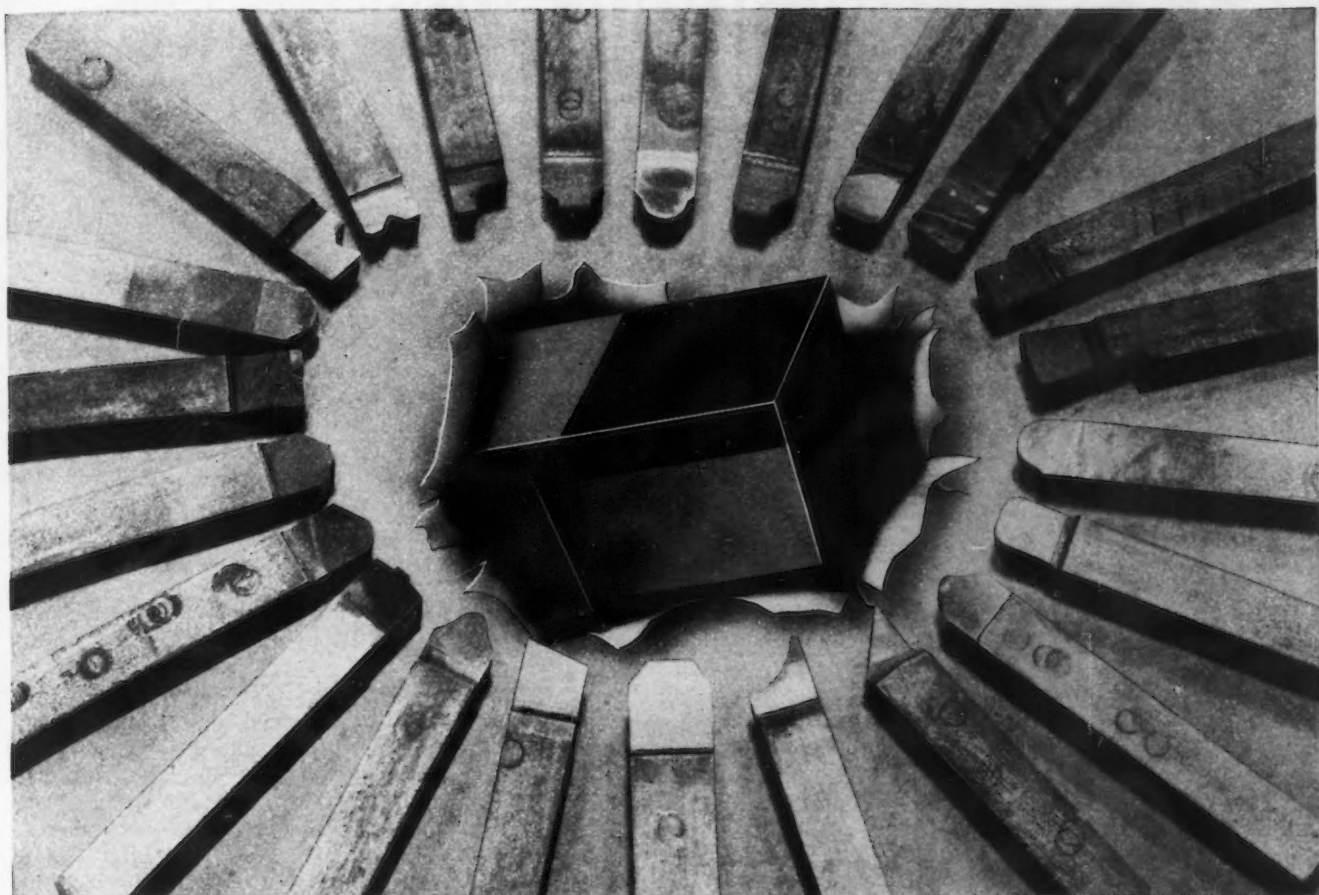


## New Restrictions Are Coming, Nelson Says

Washington

• • • Donald M. Nelson, WPB chairman, told a press conference on Tuesday that suspension of the production of all consumer durable goods and civilian construction would occur within the next 60 days. The conversion orders already issued and the construction and steel regulations to be issued shortly, he said, "would change the face of American industry."

Mr. Nelson said that machine tool shortages and difficulties in expansion of industrial facilities were the greatest bottlenecks in converting all industry to war production, but that automobile engineering skill was shortening many processes and solving many problems. Production is exceeding expectations he said.



## How You Can Make 200 Special Tools From ONE Style of Carboloy Standard Stock Tool

To get special carbide tools on the job **FAST**, a large bushing and bearing manufacturer adapts hundreds of special shapes from Standard-Stock Carboloy Tools. Illustrated are a few of over 200 different shapes, used for chamfering, grooving, forming, etc., that this manufacturer adapts from just **ONE** style of Carboloy tool!

To do this job fast they maintain a stock of these standard tools and grind the shapes as required. Many of the simpler types are ground to shape in 5 or 10 minutes, while others, containing complicated angles and radii, held to limits up to .0005", require proportionately longer periods. In every case, these "special" tools can be ground and placed on the job the same day requested! No delays awaiting deliveries.

Carboloy Standard-Stock Tools—available in 10 styles—are manufactured by Carboloy in "mass production" quantities and are always available faster than specially shaped tools. Check your special-shape tool drawings against Carboloy Standard specifications. Write for Catalog GT-140.

**CARBOLOY COMPANY, INC., 11153 E. 8 MILE ST., DETROIT, MICH.**

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WEAR RESISTANT PARTS •

**CARBIDES**

FOR THE MANUFACTURING • MINING • TRANSPORTATION • CONSTRUCTION INDUSTRIES



# WEST COAST . . .

• **CIO-UAW demands communal pool of machinery, labor and engineering talent in Pacific Coast airplane plants . . . Eight major firms organize council which is designed to coordinate and speed production.**



**S**AN FRANCISCO — In past months, some aircraft manufacturers have said they were unwilling to go full speed ahead on production because they had no further contracts in sight when current orders were completed. That this is by no means a universal situation is demonstrated by the case of a manufacturer of bombers whose backlog, with production at the present rate, would guarantee operations for over six years.

These contracts, of course, were not awarded with the idea that they would take six years to complete, but the six-year figure is an effective demonstration of how much the current production rate is expected to be stimulated. Publication of actual backlogs or production rates is forbidden.

Traced back to its source, the underlying reason why current production is not faster is lack of materials. The larger aircraft parts manufacturers are busy, but those with 50 or less employees are having a struggle for survival.

One of the most tragic aspects of those plants unable to work three daily shifts seven days a week is the idleness of machines during periods when the plant is not working.

**A**LREADY unhappy because of inability to secure materials for full-time parts and plane production, the Southern California aircraft industry last week faced a spring drive by the CIO-United

Automobile Workers to form a communal pool of machinery, labor, and engineering talent. The United Automobile Workers' plan is built around these points: 1. Immediate creation of production committees with equal representation of labor and management in every aircraft plant. 2. Immediate survey, to be made by representatives of labor and management, of all machinery in the plants to include the type, amount of work being done, hours and operations, and the type of work that can be done.

(Last Sunday, eight major Pacific Coast plane makers announced the organization of the Aircraft War Production Council, Inc., to coordinate and speed production. The council will serve as a research and information agency for its members, facilitate the interchange of information, and "encourage and expedite the pooling of facilities, plans, practices and data contributing to increased management and employee efficiency and the maximum production of military airplanes." The council is a far cry from the CIO proposal which, with union business agents sitting in on planning sessions, would convert confusion into chaos.)

The UAW proposes that functions of the regional aircraft production committee would be, "to exchange ideas and production methods; pool skilled and experienced personnel; pool machinery and equipment; allocate the flow of essential material necessary for maintenance of maximum output."

**T**HE principal aircraft plants with CIO bargaining agents are North American and Vultee. These are the plants which have suffered vicious strikes.

The second point in the program—survey of machinery—apparently was put in at the insistence of representatives of automobile assembly plants which have been closed down over the protests of the workers. The union is not satisfied that the plants cannot immediately be converted to war production.

Formation of a regional aircraft production committee—proposed in the union's third point—might be an effective catalyst for the conversion of confusion into chaos. Talk

of pooling tools comes cheap, but the difficulty involved in moving the type of tools essential to aircraft production, most of which weigh several tons, is great. Lack of tools is not what is holding back production now. Turning over to any committee the allocation of materials would not exactly meet favor with the Army or Navy. The idea of pooling skilled and experienced personnel is very much the same idea as the kulaks and the cows—it's all right if it's somebody else's cow that is to be pooled. Ideas and production methods are already being exchanged.

In direct opposition to the CIO's idea of decentralizing the aircraft industry, both in manufacturing operations and direction, is the often advanced idea that a production "czar," chosen from within the industry itself, would be beneficial. The strongest endorsement the "czar" idea has yet received came last week from the Senate subcommittee, headed by Senator Truman, investigating defence production. After indicting the old OPM for poor planning of aircraft production from aluminum ingots to finished planes, the Truman committee said that it had been told that the present War Production Board does not have a single top-notch aircraft production man in its organization. The WPB, the Trumanites said, should set up a section charged with overall planning for aircraft production, such section to be headed by a trained aircraft production executive drafted from the industry. That would be a far cry from the decentralization and myriad committees of committees of committees which the CIO wants.

**T**HE man most often mentioned as a possible "czar" is Major R. H. Fleet, who a few months ago sold his principal interest in Consolidated Aircraft Corp. to Vultee and turned its direction over to Tom Girdler. Before leaving Consolidated, Major Fleet had been outspoken in accusing the government of too much interference in the aircraft industry, particularly in its labor policy. It might logically follow that if Major Fleet now were to be appointed as "czar" of aircraft production that there would be more than a mere cen-

With the  
Emphasis  
on **SPEED**

# FOSDICK Jig Boreers

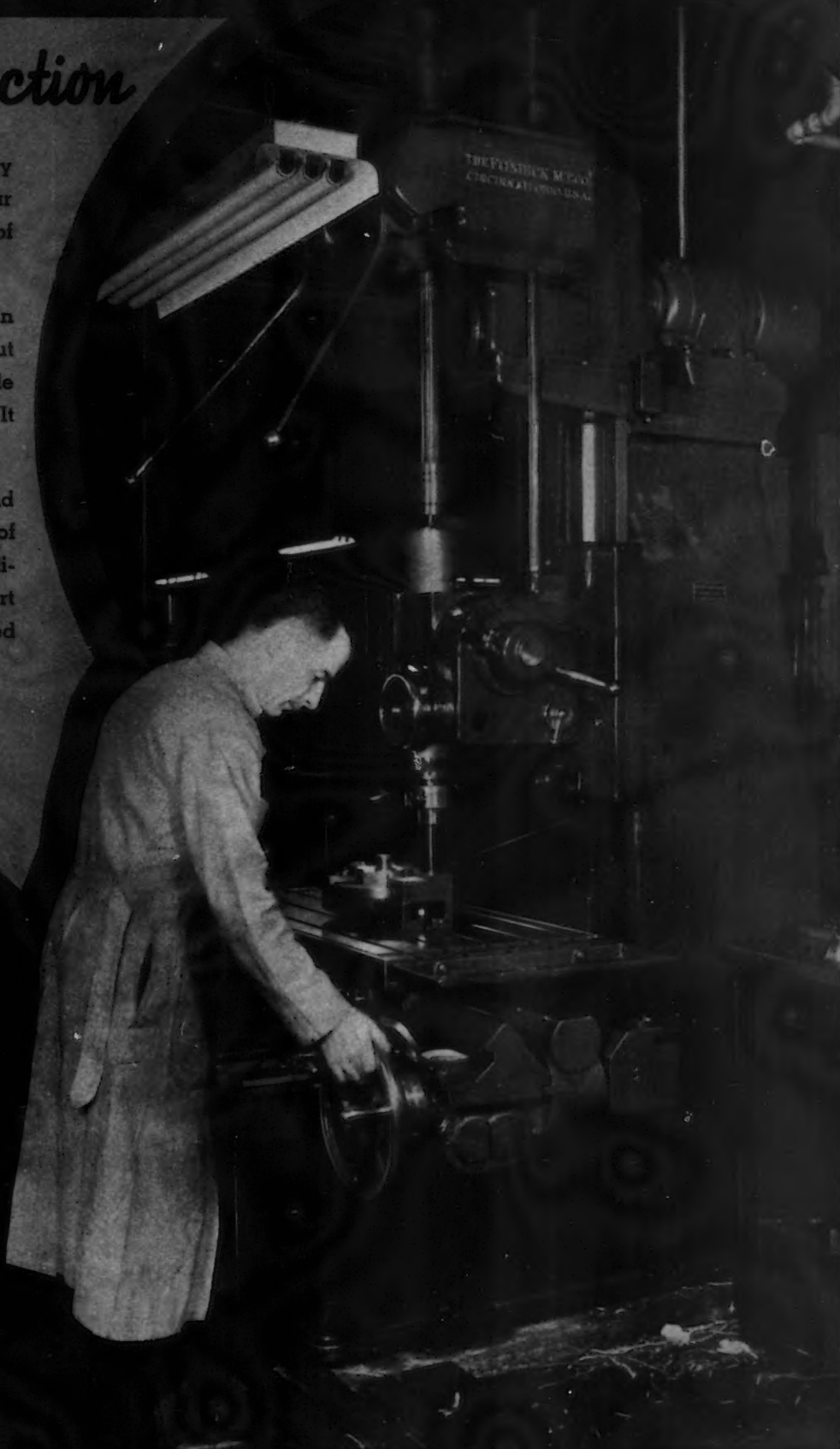
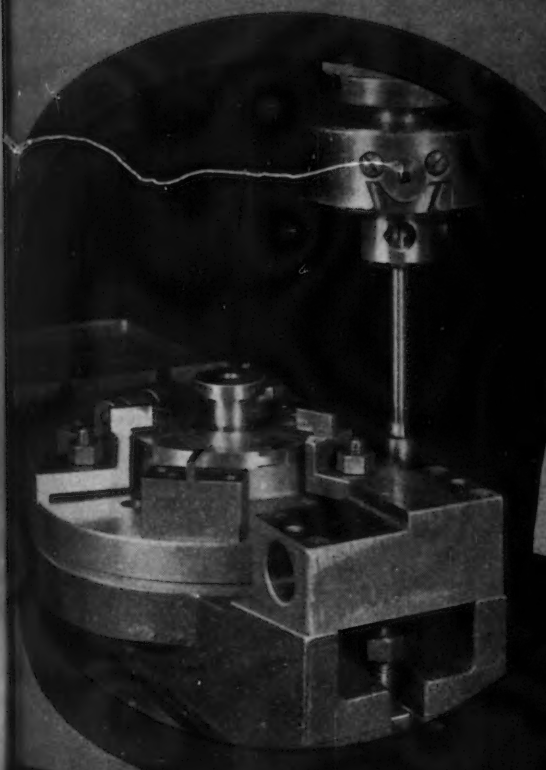
## Rush Tool Production

Tools, dies, jigs and fixtures are needed today in huge quantities to tool up America's War production on a scale to meet the demands of our constantly growing armed forces.

The Fosdick Jig Borer is doing a major job in many of the Tool & Die Shops throughout the country. Here's a machine that can handle a wide variety of work—quickly—accurately. It is ideal for the tool shop.

Illustrated is one of them working in a Tool and Die Shop in a midwestern city. The ease of operation and simplicity of control enables ordinary operator to become proficient in a short time and eliminates necessity for highly skilled workmen.

Jig Borer Bulletin J. B. A. gives complete details. Write for a copy.



# FOSDICK

**MACHINE TOOL COMPANY**  
CINCINNATI . . . OHIO



tralization of power. More likely a complete revamping of government policies would follow.

The Truman committee's criticism, like most other political inquiries, was extremely superficial in its failure to recognize that many of the present difficulties would have occurred whoever did the planning. Present material shortages not only are a result of stepping up production goals too rapidly, but of an absolute impossibility of doubling, tripling, or cubing of capacity overnight. Processing in consuming plants is much more readily planned and built than

magnesium . . . including the so-called Doerner process developed . . . and used in a pilot plant at Pullman University, Wash." Inasmuch as there is no such institution as Pullman University and the Doerner pilot plant is located at Washington State College, Pullman, Wash., one wonders whether the balance of the magnesium comment reflects the same scientific accuracy.

Simultaneously with the publication of the Truman report, which recommended that Henry J. Kaiser's Permanente Metals Corp. be allowed to produce magnesium at

find out the obstacles to getting a plant of this size into operation at a point where entirely new facilities must be constructed to carry power and water a considerable distance.

Four of six lodges of the Seattle Aeronautical Mechanics Union have voted to eliminate double time for Sundays and holidays, making it feasible for Boeing to inaugurate around-the-clock work. The other two lodges are expected to confirm this action. Pay will follow the same plan adopted by many Pacific Coast shipyards—base pay for the first five days of any week, time and a half for the sixth day, and double time if a seventh day is worked, without regard to the sequence of calendar days on which the work takes place.



**TO TURN THE WHEELS OF WAR:** Behind the production of weapons for war is the power to turn the wheels producing war materials. This assembly line is in the penstock fabricating plant at Shasta Dam, Sacramento, Calif. The big steel pipe sections are being welded together to form the penstocks that will carry water from the reservoir to the electro-turbines in the power plant at the base of the dam.

basic production units, which require more time whoever is in charge.

Hopes that a big aircraft production spurt will result immediately from operation of big new Eastern plants are misplaced. If there is not enough material to make necessary parts, and consequently not enough parts, the magic of auto makers' names is not going to build planes any faster.

**ALTHOUGH** the Truman committee spent a considerable portion of its time in California investigating effects of the war upon the sardine and tuna fishing industries, and a scheme for filling in San Francisco Bay, a number of pages of the report were devoted to magnesium production. The report stated that "the sub-committee explored in considerable detail the various processes for producing

cost while conducting experiments into possible cheaper production methods, Dr. Fritz Hansgirk who had been chief technical advisor for Permanente was transferred to an enemy alien reception center from the jail where he had been held for 3½ months at the request of the FBI. Definite clarification of Dr. Hansgirk's status, one way or the other, was one obvious recommendation for pushing magnesium research which the committee failed to make. The Permanente plant has suffered another discouraging blow through the death of its superintendent and chief construction engineer, Harry Davis, in an automobile accident two weeks ago.

The Truman report scalded the WPB and Defense Plant Corp. for its handling of the Basic Magnesium, Inc., construction and operation contracts for its plant in the Nevada desert, but failed to

## War Department Announces New Construction Projects

• • • The War Department announces:

Authorization for construction of an Air Force school at Marianna, Fla., to cost in excess of \$5,000,000. Construction will be supervised by the Mobile, Ala., district office of the Corps of Engineers.

Authorization for construction of an Air Force training school at Hondo, Texas, to cost in excess of \$5,000,000. Construction will be supervised by the San Antonio, Texas, district office of the Corps of Engineers.

Authorization for construction of an Air Force training school at Carlsbad, N. M., to cost in excess of \$5,000,000. Construction will be supervised by the Albuquerque, N. M., district office of the Corps of Engineers.

Award of a contract to Midwest Construction Co., Chicago, for construction of a depot in Colorado at a cost in excess of \$5,000,000. Construction will be supervised by the Albuquerque, N. M., district office of the Corps of Engineers.

Authorization for the construction of an Air Force training school near Greenville, Texas, to cost in excess of \$5,000,000. Construction will be supervised by the Denison, Texas, district office of the Corps of Engineers.

Authorization for construction of an Air Force school at Lubbock, Texas, at a cost in excess of \$5,000,000. Construction will be supervised by the Albuquerque, N. M., district office of the Corps of Engineers.

Authorization for construction of an Air Force school at Big Spring, Texas, to cost in excess of \$5,000,000. Construction will be supervised by the Galveston, Texas, district office of the Corps of Engineers.

Award of a contract to Edison General Electric Appliance Co., Inc., Chicago, for procurement and installation of equipment and operation of a manufacturing plant. Operation will cost in excess of \$5,000,000.

Award of a contract to Smith, Hinchman & Grylls, Inc., Detroit, and A. E. McMahon, Menasha, Wis., for services incident to construction of a manufacturing plant in Wisconsin. Construction will cost in excess of \$5,000,000 and will be supervised by the St. Paul district office of the Corps of Engineers.

Award of a contract to James Stewart Corp. and Fugard Olsen, Urbain & Neller, Chicago, for architect-engineer-construction-management services in connection with a manufacturing plant in Illinois. Construction will cost in excess of \$5,000,000, and will be supervised by the St. Louis district office of the Corps of Engineers.

Award of a contract to Sunbeam Electric Mfg. Co., Evansville, Ind., for installation of equipment and operation of a manufacturing plant. Operation will cost in excess of \$5,000,000.

# Eliminated! One Whole Operation!



## SUN OILS solve labor problem.. ..cut lubrication costs in half!

Here's how one of America's big stainless steel rolling mills made a triple saving ... thanks to a SUN LUBRICANT.

Other lubricants had repeatedly failed. Then they tried CIRCO ROLL OIL. In short time CIRCO proved its merit. The mill superintendent affirms that with CIRCO they've made these three savings:

1. **ELIMINATED ONE PICKLING OPERATION.** Excessive discoloration in the annealing process had occurred with all previous oils used. CIRCO ROLL OIL corrected this ... and made unnecessary the final pickling operation.
2. **REDUCED OIL COSTS ONE HALF.** With CIRCO ROLL OIL one half the former amount

of oil produced far superior results ... oil bills were slashed 50%.

3. **SAVED HUNDREDS OF MAN HOURS.** Dermatitis had been a problem ... with as many as six men at a time out. Since using CIRCO ROLL OIL not a single case has developed!

CIRCO ROLL OIL is only one of many SUN petroleum products for the metal working industry. Call in a SUN "Doctor of Industry" to show you how these specialized products may help you speed up production ... save labor ... improve product quality ... reduce rejects and save money. Write

**SUN OIL COMPANY — Philadelphia**  
Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

**SUNOCO**

**SUN PETROLEUM PRODUCTS.. HELPING INDUSTRY HELP AMERICA**



# Fatigue Cracks

BY A. M. DIX

## This Contracting Universe

• • • Miss Clara I. Cocker of the Detroit Public Library sends us a copy of a letter she received from an English manufacturer, who mentions something he saw in your favorite family journal. This causes Miss Cocker to speak of "your, obviously, *international magazine*."

Thank you, Miss Cocker, for the italics, but candor compels us to confess that we merit them less and less as the war gets bigger and bigger. Although the one big, more or less happy family is at its all-time numerical high, the war is shrinking it geographically.

And now another puddle appears in our export path. The Office of Censorship will pass on every issue of publications containing "scientific, technical, or professional data" before copies may be mailed outside the country.

With news coming in all through Tuesday, presses running all night, and copies ready for mailing on Wednesday morning, obviously there is no time to submit material for approval before printing. So a little delay in delivery of copies outside the country seems unavoidable. C'est la guerre.

## Without Honor

• • • We telephoned the Foreign Section of the New York Post Office for information on a certain feature of the new regulations. "What publication?" we were asked, "Iron Age?" our informant replied, "Hell, that's no technical data."

## Flatterer

• • • Another flatterer is the man who handles subscriptions for a certain Chicago manufacturing plant. He says, "We let your subscription expire, but to my astonishment our people here miss it, so send it again."

## Peas, Cobwebs, Pancakes

• • • We are fond of speed photographs—the kind that show what happens to a golfball when your brassie connects with it for a screaming 75-yd. slice, or when a bottle falls off the top shelf of the refrigerator and the mayonnaise begins its flight toward the kitchen walls.

So a pat on Ed (Pratt & Whitney) Shultz's broad back for that speed photograph in a recent issue showing what happens to the grinding fluid when a gear grinder is operating in high. The camera, with a lens speed of 1/100,000th of a second, "froze" the work without even the suggestion of a blur. The blobs of fluid are not tear-shaped, as we thought they would be, but are almost perfect pea-size spheres. Some of the fluid looks like cobwebs, while much of it takes the form of a solid-appearing sheet, pancake thick.

A speed photograph, showing just what happens to an automobile tire during osteopathic starts and stops, ought to save a lot of rubber.

## Post Output up 200 Per Cent

• • • Charles T. Post, who writes the ever-coruscating West Coast section (see page 84) will enter a deduction of \$1200 in Schedule D of his 1942 income tax return instead of \$400, as in 1941. His news report shown us in strict confidence reads:

While Donald Nelson was still *talking* about increased production, Mrs. Post doubled her 1939 record, as previously exclusively predicted by your correspondent. Two streamlined models rolled off the assembly line Mar. 21 at 1:26 and 1:34 p.m. Project engineer Post waved a bottle of California soda water over each hull as it slid down the ways, dubbing them Catherine Jane and Charles Truman, Jr. Catherine Jane has a live weight of 5 lb. 8½ oz. and Charles, 6 lb. 9½ oz. Both will displace

(censored) from the Post pocketbook, but Post acknowledged that mass production cut unit costs considerably.

Project engineer stated that the record had been achieved without any letdown in material standards of the previous model.

## Affinities

• • • U. S. Patent 1,251,511, issued to G. A. Guess, was prosecuted by Attorney J. Edward Maybee.  
—Keith Misegades

## With Cutout Open

• • • "Does this," asks Deac, "establish a new high slink record?" Many of them (Japs) slink along paths through the underbrush on motorcycles.  
—New York Times

## Stoppers

• • • They Were Starved for Printed Matter—Box V-19.

The fate of a nation was riding that night—Revere Copper & Brass, Inc.

## No Noise Is Good Noise

• • • Even aged men who are deaf are getting jobs in some plants as boilermakers.  
—The Iron Age

As in the case of a man with perpetual hayfever getting a job in a glue factory, a physical handicap often becomes an occupational asset.

For example, with more and more women being employed in industry, we foresee a heavy demand for nearsighted machine operators. It is well-known that output goes down and the accident rate goes up within a 40 ft. radius of the Rita Hayworth type. This means that the myopic male, with nothing on his mind but momma, the four children, and a .001 in. plus or minus, is a far better bet than an operator who keeps his 20/20 optics trained on a Helen of Troy profile three aisles away.

Or may we suggest that the goggle people market a lens guaranteed to make Paulette Goddard and Edna May Oliver undistinguishable at 10 feet?

## O.C.D. Problem

The caption on the description of the blackout device, page 85, Mar. 19 issue, says it gives "full illumination of light leaks." Pour quoi?

—Tom Ryan

Take "illumination." Subtract an "I" and a "u," start with an "e" and what do you get?

## Industrial Lubricant

Long before this I suppose you have heard that "go-down" is a corruption of Malay "gadong" meaning a warehouse.

I get the f. f. j. after all the big shots and engineers let it lie on their desks three weeks.

—C. B. White, Chemist Engineer, American-LaFrance-Foamite Corp., Elmira, N. Y.

The cure for slow passage of copies through large organizations is usually routing slips. We supply them free, with the company name at the top and names of readers below. Send us a list with names arranged in proper routing order; we'll run off a hundred slips for you and have them to you in ten days.

## Puzzles

The answer to last week's barely imperceptible load on your cerebrum is 15.

Among those who found the March 26 farm problem too easy was E. P. Speasmaker, Armstrong Metal Products, Inc., London, O. Mr. Speasmaker is also London's mayor. First time we've ever heard from a mayor and we're flattered.

A solution to this in three minutes puts you in with the mentally alert upper 5 per cent.

A man and wife, each weighing 160 lb., have two sons, each weighing 80 lb. They desire to cross a river in a boat that can carry no more than 160 lb. How do they get across, and leave the boat on the farther side?

## You may never do this on a *Northern* HI-LIFT HOIST

A Northern Hi-Lift Hoist will serve for years without requiring any attention to the gear mechanism. The design and construction forestalls wear. Gears are machine cut, heat treated steel—shafts are turned and ground steel. Roller bearings are of ample size, and the whole mechanism is splash lubricated.

But if you do have to open the case, note that it is an easy job—and all parts are immediately accessible.

## Mechanical Load Brake Renewals are infrequent but easy

The Northern Mechanical Load Brake is a rugged, long-lasting mechanism. But all brakes have wearing surfaces which must be renewed at intervals. You can do it very easily on the Northern Hi-Lift Hoist—just loosen a few bolts, and the brake mechanism is removed without disturbing the gear case.

## Delivery on Heavy and Light Duty HI-LIFT HOISTS

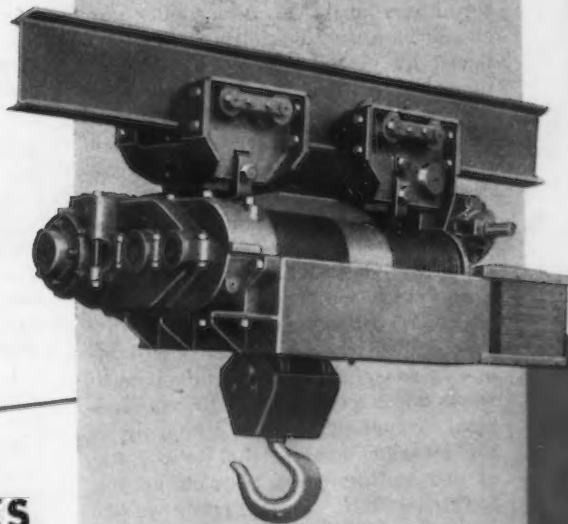
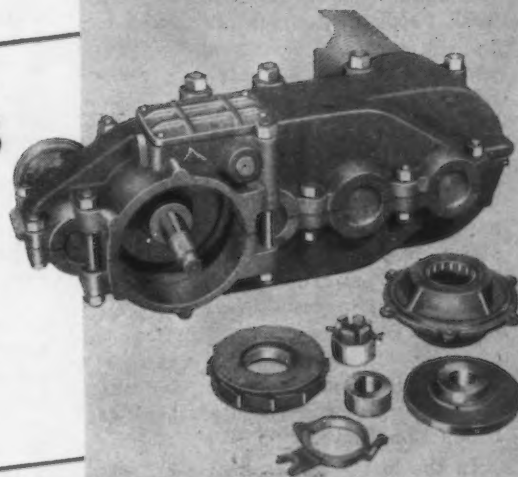
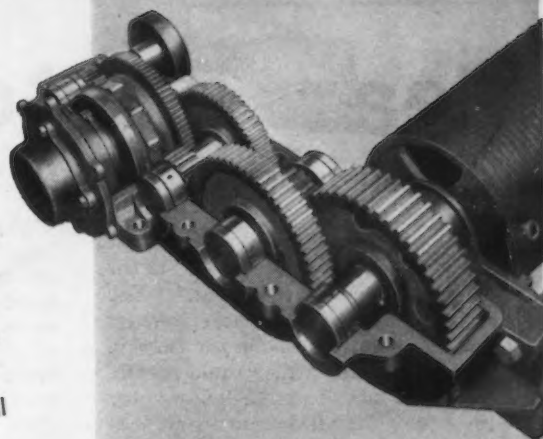
Northern Hi-Lift Hoists are built in 1000 lb. to 15-ton capacity—in single motor and two-motor types. Two-motor hoists may be fitted with cabs. We are in good position to make excellent deliveries on all commonly used types.

### NORTHERN ENGINEERING WORKS

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*Write for New  
Catalog of Hi-Lift  
Hoists*





# Dear Editor:

## OUTPUT RESTRICTION

Sir:

I have read with great interest the March 12 editorial, entitled "Labor Restrictions on War Output." You have cited an instance where workers are turning out two shells per twenty-four hour day when they could readily produce twenty-four shells per day with newly installed machinery.

Donald Nelson in launching the War Production Drive has asked us to look into our hearts and answer whether we are doing today every single thing within our power to put more weapons into the hands of our fighting men. There are all too many, both in management and labor, who today cannot truly answer "Yes, I am doing my very best." There are all too many instances of failure to meet full production, some due to management neglect, some due to the unfortunate self-imposed restrictions of labor. If we are to be victorious these conditions must be changed. That is a major purpose of the War Production Drive.

In the last paragraph of your editorial you state, "I think that there should be a confidential bureau established by government to which both management and labor could refer such cases for investigation, with assurance of anonymity to prevent plants being struck or men being fired." My purpose in writing is to say to you that there is such a bureau already established. It is the Industrial Relations Section of the War Production Board which is headed by W. Ellison Chalmers. In this Section are labor consultants and industry consultants whose duty it is to work with labor and with management as confidentially or as openly as the occasion demands but to the end of eliminating these restrictions you have described. In this crisis we are finding ourselves able by cooperative action to break some of these traditional stalemates of which all are ashamed.

You can be of further assistance in this huge drive, if through your paper you can both bring to the surface opportunities to increase war production and draw to the attention of your readers this Industrial Relations Section of the War Production Board to which such questions should be referred.

**J. W. NICKERSON,**  
Chief, Industry Consultant  
Service, Labor Relations  
Branch

War Production Board,  
Washington, D. C.

## NO PAGE NUMBERS

Sir:

I keep references to articles in IRON AGE and find that it is often necessary to thumb the pages backward or forward and do a little arithmetic to arrive at a page number for an article. Take for example, the article on page 60 of the March 12, 1942 issue. Four consecutive pages show no page number.

**H. H. LURIE,**  
Cummins Engine Co.,  
Columbus, Indiana

• For aesthetic reasons, art editors believe page numbers should be left off pages containing illustrations that "bleed," that is, run off the page. Our art editor is no exception. We shall try to reason with him.—Ed.

## FIGHT

Sir:

We have received the fifth edition of The Iron Age Priority Section, and have already found it to be indispensable. The only objection we have to it is that the Purchasing Desk and the Sales Desk are fighting over it. We would greatly appreciate the receipt of another copy and will gladly pay your charge for same.

**J. R. TIERS**  
Braden Winch Company,  
Tulsa, Okla.

## NAIL HEAD-HITTER

Sir:

You certainly hit the nail on the head in your editorials, "Labor Restrictions on War Output" and "Let The War Wait." If it is not too much trouble, could you send a copy of these two editorials to each of our Senators and Congressmen in Washington?

I am enclosing a check for \$100 which I hope will be enough to pay for this job. If you need any more I will be glad to send a check. If this is too much, will you please send the remainder to some Service Relief Organization such as the U. S. O.

Congratulations on your ability to point out the weak spots in our Offense Plan.

—**MACHINERY BUILDER**  
• IRON AGE check for \$42 is going to the U. S. O.—Ed.

## DURONZE?

Sir:

Referring to the inquiry on last week's "Dear Editor" page as to "Duribronze," perhaps Mr. Agricola is mistaken in his spelling and means "Duronze," which is made by the Bridgeport Brass Co., Bridgeport, Conn., in several grades.

**H. C. BOYNTON,**  
John A. Roebling's Sons Co.,  
Trenton, N. J.

## CLEVER CARTOON

Sir:

We are wondering if we may have your permission to reproduce your very clever cartoon from page 78 of the January 1 issue in our employee paper, the Brake Shoe News.

**ROBERT H. RAMAGE**  
The American Brake Shoe &  
Foundry Co.,  
New York, N. Y.  
• Granted.—Ed.

## TEMPILSTICKS

Re: Anti-Glare Precautions

Sir:

In your issue of July 24, 1941, T. E. Lloyd describes the use of Tempil or Tempilstick temperature recorders. I should be obliged if you could inform me where these can be obtained.

**J. C. HUDSON**  
The Iron and Steel Institute  
Birmingham, England  
• From Tempil Corp., 132 W. 22nd St.,  
New York.—Ed.

## SALVAGE

Sir:

I am very much impressed with your "Salvage" editorial and would like you to send me 20 copies, so that I can send them to some of my good friends, especially to Don Nelson, Trubee Davison, Bill Knudsen and Henry L. Stimson.

I wish this editorial could be enlarged and put on the bulletin boards of every defense plant in the United States, and also be in the hands of the chiefs of inspection of all Government offices throughout the United States.

**LEONARD S. HORNER**  
New Haven, Conn.

## MA PERKINS' CHILDREN

Sir:

I was particularly interested in your letter to General MacArthur (Mar. 26). Possibly you are a little too severe on the Union men. In home life it is particularly difficult to train a boy in his teens when the father tries to correct him and mother speaks up stating that the boy is doing all right. Most Union men are still in their teens as far as their experience with the Union goes and when Ma Perkins encourages them in their sit down strikes and demands for higher wages and more over-time and Pa Roosevelt agrees with her, it is extremely difficult to train these growing children.

**GEO. C. BINGAMAN,**  
American Lime & Stone Co.,  
Bellefonte, Pa.



AT MONARCH  
we work  
under these flags  
for VICTORY

## AUTOMATIC LUBRICATION

CONCEIVED BY THE

# *Phantom Gear*

THE AUTOMATIC lubrication system used on Monarch Lathes provides the positive protection required for today's production schedules where lathes must operate for long periods at high speeds.

Through this system, the correct amount of filtered oil is automatically supplied by forced pump pressure to the carriage, to the compound rest bottom slide, and to all apron parts, including the apron half nuts. The headstock spindle bearings are pump lubricated while other vital parts are spray or splash lubricated.

Thus Monarch Lathes are always adequately protected against the lost

man-hours, down time and damaged mechanisms caused by faulty lubrication.

★ ★ ★

Automatic lubrication is typical of the many developments which add to the utility, productivity and continued accuracy of Monarch Lathes. Like other important improvements it came from our constant effort to improve lathe quality and usefulness. We at Monarch call this spirit "The Phantom Gear."

Its energizing force now inspires us to maximum production with no letdown in quality, so important in the building of the many implements of VICTORY.

THE MONARCH MACHINE TOOL COMPANY . . . SIDNEY • OHIO

# MONARCH



# LATHES

COVER THE TURNING FIELD

### *Monarch's March of Progress*

No other builder has contributed so many important lathe improvements as has Monarch. For instance:

*Automatic force feed lubrication*

*Helical geared headstock*

*Anti-friction bearings for all rotating parts*

*Flanged spindle nose*

*Anti-friction bearing taper attachment*

*Flame-Hardened beds*

*Automatic sizing for all size lathes*

Improved accuracy, faster production with less effort, and a wider use of lathes have resulted from these important improvements. For newest lathe developments, keep in touch with Monarch.



# This Industrial Week . . .

RECENTLY approved iron and steel expansion projects reach steel-making centers from the Atlantic Seaboard to the Pacific Coast and are intended particularly to increase the nation's capacity for making plates and pig iron.

New steps in the steel expansion, accelerated by ever-growing war demand, include the building of four blast furnaces, two plate mills and the installation of facilities at more strip mills to produce plates.

To meet the needs for more pig iron and particularly for plates—one of the shortest items in both the first and second World Wars—Otis Steel Co. of Cleveland will erect a 1200-ton blast furnace and a battery of by-product coke ovens, and will convert its continuous strip mill for plate production.

Another blast furnace and a battery of coke ovens will be built for Wheeling Steel Corp., permitting a stepping up of open hearth output at one of this company's plants with charges of hot metal.

The largest enterprise in the current expansion, which will broaden the gap between pig iron capacity of the U. S. and other countries by 2,250,000 tons, is the Defense Plant Corp.-financed \$50 million plant to be constructed in California by Henry J. Kaiser Associates. This unit will consist of one new 1200-ton blast furnace, an old 200,000-ton blast furnace to be shipped to California from Alabama, a battery of coke ovens, one open hearth furnace and a 110-in. plate mill.

## Alan Wood Will Have New Mill

While details concerning one or two of these projects have been published, news of the others came in the last few days. The second of the new plate mills rolling products needed for ships, railroad cars, synthetic rubber

plants and other vital uses, will be built by Alan Wood Steel Co. The Alan Wood program includes a new blast furnace, a battery of 58 by-product coke ovens, and the rehabilitation of open hearth capacity. Colorado Fuel & Iron Co. will build a blast furnace with annual capacity of about 275,000 tons.

The Otis, Wheeling and Alan Wood expansions will be jointly financed by the companies involved and the DPC.

In the steel industry and in many other divisions of the metals industry, vast expansions in capacity are being undertaken, some of them unpublicized because of censorship regulations, all of them going forward under forced draught.

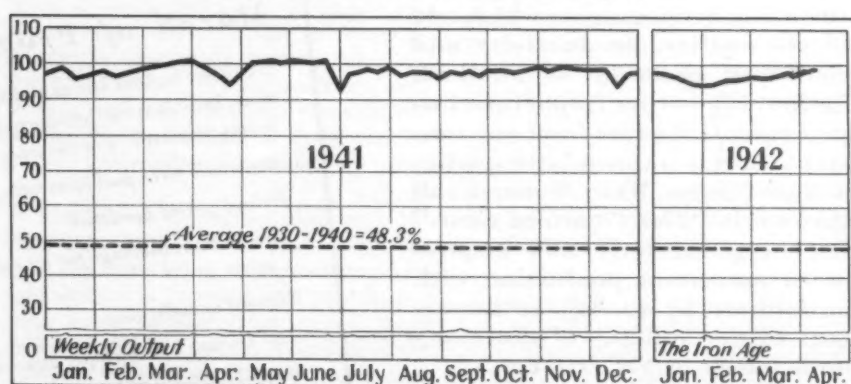
This week industry and the public had another interesting view of how the arms program is developing, from a man in a position to get an overall picture. "We are ahead of schedule on tank production," said Donald M. Nelson, chairman of the War Production Board. "Our production of merchant shipping is rising rapidly; we should meet this year's schedule. The same is true of our production of anti-aircraft and anti-tank guns. In March we again met the (aircraft) schedule which increases in line with the President's objective."

## Nelson Makes Explanation

At the same time Mr. Nelson gave at least one reason why some aircraft plants have not operated at 100 per cent. "A short time ago it became necessary to put much greater emphasis on the long-range four-engine bomber," Mr. Nelson said. "That obviously meant much heavier demand for airplane motors and superchargers. That, in turn, meant a temporary reduction in the number of motors that could be supplied to certain manufacturers of single-motored and twin-motored planes. In a few cases that caused those manufacturers to cut their operating schedules to five days a

### Steel Ingot Production—Per Cent of Capacity

(Open Hearth, Bessemer and Electric Ingots)



### Steel Ingot Production, by Districts—Per Cent of Capacity

	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	South	Ohio	West	St. Louis	East	Aggregate
Last Week.....	100.0	104.5	100.0	90.5	97.0*	106.5	83.0	95.0	105.0	104.0	97.0	101.0	98.0	98.5	
This Week.....	100.0	104.5	100.0	91.0	95.5	109.5	83.0	95.0	105.0	104.0	97.0	103.0	102.0	99.0	

\* Revised.

week. The fact was, of course, that those reduced operating schedules were not the fault of either the workers or the executives, in the plants concerned."

Since distribution of vital material and equipment to the right war plants at the right time is as complicated a procedure as the disposition of the nation's armed forces throughout the world, industry this week was cheered by progress of the War Production Board plan for policing its priority controls.

Surveys of priority violations have already been undertaken in steel, iron and steel scrap, aluminum, copper and pig iron. Various other studies covering the use of preference ratings by steel warehouses, and chrome and nickel consumers are planned.

The WPB has already surveyed 3500 companies and is investigating the priority operations of more than 10,000. Of the 3500 surveyed, more than 1600 revealed no violations while approximately the same number were found to have committed minor violations, largely through misunderstandings. Punitive action was taken against 46 firms and one individual. Apparently the results of priority violation studies made so far establish the fact that there are few wilful violators but many companies are breaking the priority regulations through ignorance of the system's complicated workings. J. S. Knowlson, director of the Division of Industry Operations of the WPB, again told industry: "We must have compliance, all the way."

*This week's roundup of latest priority developments and revisions in the latest IRON AGE Priorities Guide (fifth edition) appears on page 148. A summary of price developments in the metalworking industry is carried on page 141.*

Meanwhile the steel industry which has lifted production far beyond the levels expected, reports another flood of orders. At New York, the emphasis was not only upon plates and shell steel but on light steel for ammunition boxes, bomb cases, and similar items. Many steel companies report March shipments included from 96 to 97 per cent priority rated business and believe 99 to 100 per cent of April business will be rated tonnage.

Steel ingot production this week squeezed out another all-time ton-

## Metal Show to Be at Detroit Fair Grounds

Cleveland

• • • At the April 6 meeting of the Cleveland chapter of the American Society for Metals, Secretary William Eisenman revealed that the National Metal Show will be held the week of Oct. 14 at the Fair Grounds in Detroit, and that the theme of the show would be "Aids to Production."

nage record, with operations gaining a half point to 99 per cent of capacity, according to IRON AGE estimates. This week's gain was due to minor advances in several areas, with only one district, Cleveland, showing a decline. Pittsburgh, Chicago and Youngstown, the nation's three largest producing centers, continue to operate at 100 per cent of capacity or better.

## March Output At New Peak

Pittsburgh and Chicago operations this week are unchanged at 100 and 104.5 per cent respectively, with Youngstown holding at 100 per cent. Philadelphia is up a half point to 91 per cent, while Cleveland is down 1½ points to 95.5 per cent due to repairs. Buffalo rose three points to 109.5 per cent. Wheeling and Birmingham are unchanged at 83 and 99 per cent respectively, while St. Louis gained two points to 103 per cent. Detroit is unaltered at 105 per cent, as is South Ohio River at 104 per cent.

March output of steel ingots and castings was 7,392,911 net tons, a new all-time high, according to the American Iron and Steel Institute. Total first quarter production was 21,038,889 tons. Production in February was 6,521,056 tons.

Under the OPA price schedule for Lake Superior iron ore, announced Tuesday, some sales may command the \$4.45 base price, while others will be made at prices as low as \$4.15 or less. Long term contracts which expired at the end of last season and are up for renewal are to be based on the weighted average of seller's spot or one-season sales in 1941.

Since Army, Navy, Maritime Commission and lend-lease classifications will take practically all

steel output for the remainder of 1942, other types of business, however essential, will be pushed aside. Lend-lease orders for Russia are increasing sharply and cover vast tonnages. One order alone involves more than 100,000 tons of oil casing and from 30,000 to 40,000 tons of line pipe.

Reports from some machine tool centers indicate that the detailed statistics on prospective deliveries required by the WPB frequently are obsolete before they are put in the mail and are of little value at Washington. Frequently a rush of A-1-a business forces a complete redrawing of machine tool shipping schedules.

Some tin plate manufacturers who must obtain their black plate from wide strip mills already jammed with plates and sheets, this week were fearful that the A-1-c rating authorized for tin plate may be too low to enable continuous production. Some steel producers with wide strip mills are likely to run into difficulties in producing the urgently needed tin plate.

## Seek Orders for Certain Mills

During the last 10 days, steel salesmen have again started on a hunt for high-rated orders for finishing lines operating at a sub-normal rate. Thus, a company with its bar mills heavily taxed with A-1-c or higher orders will seek business for its finishing mills to balance out production. Other steel salesmen are becoming specialists on the operations of the priority system.

Iron and steel loadings for the second quarter of 1942 are estimated at 644,241 cars, an increase of 5.3 per cent over loadings in the corresponding period last year, according to the 13 shippers' advisory boards. Coal and coke loadings for the second quarter are estimated at 2,276,137 cars compared with 1,735,607 cars in 1941. Iron ore loadings of 983,874 cars are predicted for April, May and June.

Fabricated structural steel awards for the week are estimated at 33,500 tons compared with 23,100 tons last week, with new projects at 51,900 tons against 46,500 tons a week earlier. Reinforcing steel awards for the week rose to 37,950 tons from 30,650 tons last week while new projects climbed to 5300 tons from 1865 tons.



# PLURAMELT SAVES VITAL ALLOYS!



## AS LITTLE AS ONE-FIFTH OF THE SECTION NEED BE STAINLESS STEEL

**H**AVE you ever considered that—in a great many of stainless steel's uses—most of the stainless steel section never gets a chance to put its special properties to work? Actually, only the *surface* is on duty; corrosion and wear never have a chance to go any farther.

To save, and to help you save, this strategically vital material we've developed *Pluramelt*, a mild or low-alloy steel base inseparably armored with practically any grade of stainless on one or both sides. Besides saving as much as 80% of the chromium and nickel that a solid stainless section would require, *Pluramelt* leads to favorable first cost and fabricating cost. It's a development you should know better, both for today's problems and for the future.



*Send for  
this new  
Bulletin*

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Send me the new Bulletin on Single  
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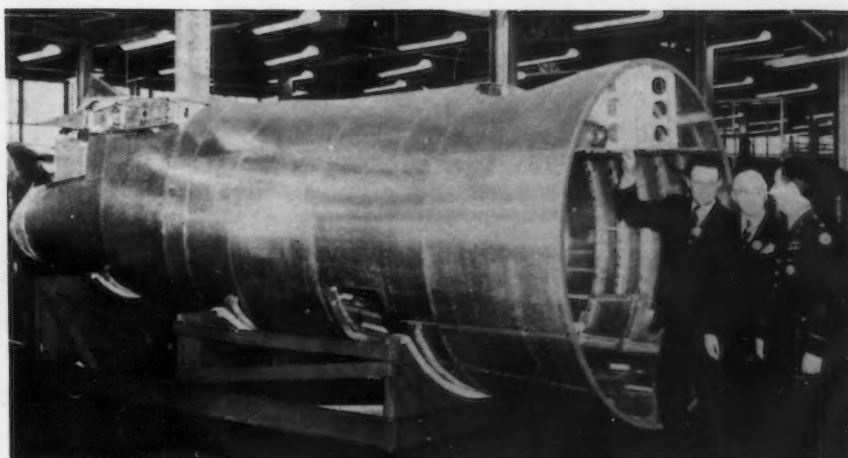
Name .....

Address .....

Company .....

# News of Industry

• • •



**HEADING FOR TOKYO:** This tail section of the Martin medium bomber is being assembled by Hudson Motor Car Co., and may find its way into the Far Eastern war theater. In the photo, left to right, are J. W. Eskridge, superintendent of the Hudson Aircraft Division; A. E. Barit, president of Hudson; and Captain Walter R. Godard, Army Air Corps resident representative.

## Pearl Harbor Has Little Effect on Ohio Plant Output

By B. W. CORRADO

Cleveland

• • • A test survey conducted by THE IRON AGE at 14 plants selected at random through Central and Western Ohio revealed that at nine plants there had been no increase in per-man output or efficiency since Pearl Harbor, at one plant with an AFL union per-man output had actually declined, and although worker output was up at the four other plants, in three of them the rise was very slight and company representatives were "uncertain as to its extent, but supposed that it was up."

These plants, producing war materials or machine tools vital to the defense program, all had been asked by the government to expand their facilities to increase production, and most of them had done so or were in process of increasing plant space. Despite the shortage of skilled help at 13 plants, training programs were being conducted in each case, although this situation prevented 24-hr.-a-day operation, seven days a week, at all but one plant.

Although most plants were from three months to a year behind in deliveries, only four of them were operating on Sundays, and in three of these cases, Sunday was being used as a "catch-up" day during which departments that were lagging behind worked. Failure to receive 100 per cent efficiency per man was spotlighted at one plant

where it was estimated that about a half hour's time is wasted in each of its three shifts, or  $1\frac{1}{2}$  hours per day, representing a 6 per cent loss in potential production. Plants which did not operate on Sundays usually did not have enough men or else had insufficient material to permit continuous 7-day operation.

Material shortages included bearings, motors, steel castings, cast iron castings, alloy forgings, and steel scrap. One company's production in a recent month was reduced by  $\frac{1}{3}$  due to insufficient steel castings. Additional obstacles preventing maximum output included "red tape," from waits for high priorities for necessary materials to Federal approval of a high priority rating for plant expansion requested by Washington, plus the tight pig iron restrictions preventing the maintenance of an adequate stock of different types of iron, resulting in recurring brief shortages.

It is interesting to note that the opinions of the management and men regarding the most practical shifts for working time varied from plant to plant. In some plants the men preferred to work two swing shifts of 11 or 12 hr. a day, six days a week, while in others the men preferred the 8-hr. shift, six or seven days a week. Moreover, it should be noted that in most plants at least two hours of production time a day was lost due to lunch hours or rest periods,

during which vital machines remained idle. Apparently, no plant had devised a method of keeping all machines busy 24 hr. a day.

All but one of the 14 plants visited were merely "thinking" of employing women, despite the dwindling supply of available men. Moreover, employers shied at the prospect of employing and training negro machine operators, usually due to opposition by unions or doubts as to the reaction of their employees. This situation leaves most of the plants studied very vulnerable to any sudden tightening in draft exemptions.

"Absentees" apparently are a growing problem for employers running war plants, since the high salaries being received by the men evidently are conducive to frequent A.W.O.L. holidays. This production loss is indulged in by skilled employees in the knowledge that their desperate employer trying to keep up his plant's war production does not dare to fire trained workers.

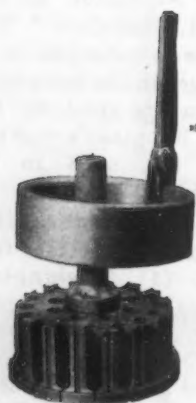
Employers attributed the failure to receive peak production from their men to (1) Washington's failure to appeal for more production per man; (2) Union pressure to hold down the production rate to pre-war levels, and regarding attempts to increase production as "speed-ups," undesirable even in time of war; (3) The employees' apparent lack of appreciation of the seriousness of the war.

(PLEASE TURN TO PAGE 98)



# SUPER-CYCLONE KEEPS RINGS ROUND

by utilizing 100% Forced Convection Heating with temperatures to 1750°F.



This old method of putting the heated ring on a jig and quenching the whole assembly produced 8 rings per hour.

ABOVE you see another example of the Super-Cyclone's ability to increase production, reduce handling, and minimize distortion, with 100% forced convection heating. The illustration shows a load of 63, SAE 52100, bearing races on a fixture, being charged into a Super-Cyclone furnace. When heated through, the rings will be taken from the furnace and quenched, fixture and all. When tested, they will be 62-65 R.C. and will be out of round only .006" to .010", the acceptable range.

The method used by this bearing manufacturer before the Super-Cyclone was installed was to heat the rings in a gas fired radiation type box furnace and quench individually on a special jig. This was done to hold the rings within .006" to .010" of round, which is now accomplished in the Super-Cyclone-63 at one time without jigs. The box handling demanded the constant attention of one man and then he could only turn out 8 rings per hour. With the Super-Cyclone the entire operation of loading the fixture, charging it into the furnace, heating, quenching, and unloading the fixture, takes but 1 hour and 25 minutes. Only 15 minutes of this operation requires the attention of a heat treater, leaving 1 hour and 10 minutes in which he is free to do other work. It would take 7 men

and 7 box furnaces to approximate the production of the one Super-Cyclone!

But let's put these figures on an 8 hour-day basis for a clearer comparison of the Super-Cyclone's potentialities in helping to solve your heat treating problems. We find that the box furnace produces 64 rings per day, as against 432 rings per day from the Super-Cyclone, a production increase of nearly 700%. It takes one man 8 hours, but only 1½ hours of the day does he devote to the Super-Cyclone turning out 432 rings. This means an extra 6½ man hours per day that can be used for other work.

This reduction of 6½ hours in handling time, increase of nearly 700% in production, and minimum distortion, is due to the Super-Cyclone's 100% forced convection heating principle. It drives the heat, at high velocity, through the work chamber, heating each piece thoroughly and accurately. Thus it avoids "one-sided" heat, which is the principle cause of distortion. The Super-Cyclone's heating range of 250° F. to 1750° F. makes it a highly flexible unit for many heating operations. Perhaps the Super-Cyclone would solve some of your present day heat treating problems. We would be glad to help you in weighing its possibilities.

## L I N D B E R G

CYCLONE FOR LOW COST ACCURATE TEMPERING

# 1. WHAT IS THE SUPER-CYCLONE FURNACE?

It is a further development of the Lindberg Cyclone furnace utilizing 100% forced convection heating with temperatures to 1750° F.

# 2. HOW WILL THE SUPER-CYCLONE HELP ME?

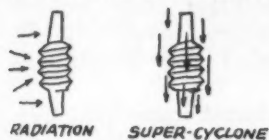
It all depends on the type of work to be done. Among the operations being handled by well over 100 Super-Cyclone installations already in service are: tempering, annealing, hardening, normalizing, and nitriding. Because the work can be preheated at any desired rate and cooled according to a definite schedule, the Super-Cyclone is well suited to stress relieving, spheroidizing, malleablizing, and other special heating operations requiring a definite cycle.

# 3. CAN THE SUPER-CYCLONE BE USED FOR LOW TEMPERATURES?

Yes. The temperature range of the Super-Cyclone is 250° F. to 1750° F. with equal heating and control accuracy within the range. This feature of the Super-Cyclone gives you a tempering, hardening, annealing, and normalizing furnace all in one and makes it a flexible unit for the small or medium heat treating department, as well as a heavy production unit for the large shop when put to work on one type of job.

# 4. HOW DOES THE SUPER-CYCLONE KEEP WORK STRAIGHT?

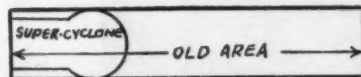
By eliminating "one-sided" heat. The work is piled up or stacked up in the work chamber, either on itself or on a fixture, and the heat is driven through it at a high velocity, heating each part thoroughly and accurately. The 100% forced convection heating principle prevents radiant heat of a source hotter than the desired work temperature from striking the charge and causing distortion. This proved itself in handling 20 pound worm gears. When hardened from box furnaces 85% went out be-



between .015" to .025". Straightening took 8 hours per 100 worms. When hardened from the Super-Cyclone, 90% required no straightening whatsoever, and the

balance were out a maximum of .010". Straightening time: 30 minutes. A reduction of 7½ hours straightening time per 100 worms.

# 5. HOW ABOUT FLOOR SPACE?



As a general rule, based on what the Super-Cyclone has done in other plants, you can figure that this furnace will require only 1/3 the floor space of any other type of equipment to handle the same or increased production. At a large midwestern plant annealing grey iron castings, one Super-Cyclone using but 1/6 the floor area, replaced 8 radiation type box furnaces and turned out twice as much work! It would take 7 box furnaces and 7 men to approximate the production of the Super-Cyclone shown on the opposite page. Another manufacturer, hardening worm gears found that one Super-Cyclone did the work of 3 box type furnaces occupying 3 times the floor space.

# 6. HOW ARE PRODUCTION POSSIBILITIES FIGURED?



You can roughly check the production increases possible through the Super-Cyclone, by spreading parts to be heated on the floor, one layer thick, as laid out in a radiation heated furnace. Then take those same parts and stack them up in a 36" circle, 4' high, making allowance for spacers or supports. Figure it will take a maximum of 3 hours to heat the stacked up parts on a fixture and 5 minutes to quench the lot. Ordinarily you will find production increases of 200% to 1000% possible. The parts remain on the fixture for quenching and tempering, a substantial saving in handling.

# 7. DOES THE NAME SUPER-CYCLONE MEAN THAT IT IS A LARGE FURNACE?

No. A standard size Super-Cyclone is made with a chamber dimension as small as 16" diameter x 20" deep. The name Super-Cyclone denotes the ability of the furnace to increase production and keep work straighter by using 100% forced convection heating with temperatures from 250° F. to 1750° F.

The name "SUPER-CYCLONE," like Topsy, just grew. During its infancy on the drawing boards, the engineers planning its potentialities, called it the "Super" Cyclone. Then came its adolescence in the shop where the boys referred to it as the "Super." When troubles developed, the service men called it something else. But whether it was affection, anticipation, or just the lack of a better name, most everyone called it the "Super."

In the advertising department we got excited at the prospect of creating a name for the new product... a name that would go down through the ages with Buick, Bon Ami, Aunt Jemima, Carter's Little Liver Pills, and many others. We burned the midnight oil with creative fervor... "Little Demon Heat Treater"... "The Chinook"... "The Senator" (100% forced convection hot air)... "Breath of Sahara"... and other names, equally as inadequate, were conceived. Each new appellation was referred to as a name for the "Super" and before we knew it, we were calling it the "Super" too! When the time came to announce it to the trade, for want of a better name, we had to release it as the Super-Cyclone. We knew then, that we were but pawns in the hand of Fate. Our dream, of launching and christening this new furnace with a bottle of "7-up" and a few well chosen words, had blown up in our faces. We feared that in letting it be known as the "Super" Cyclone, the general opinion would be that our advertising department had "gone Hollywood."

Soon, reports on the new installations came in sounding like letters from Bob Ripley... and they continue to come. We know now, that this furnace by any other name would be as remarkable. The "Super" has clicked in the field! The advertising department still feels it owes an apology for the name "Super-Cyclone," but its performance is all that the name implies.

# STANDARD SIZES IN WHICH THE SUPER-CYCLONE IS AVAILABLE

Delivery time is speeded considerably when standard size furnaces are selected, rather than special sizes which must be drawn up. Drawings are available for the following sizes of Super-Cyclones all of which have been built and are in operation. Most are gas fired, although a number are available electrically heated.

## CHAMBER SIZE

16" diameter x 20" deep
22" diameter x 26" deep
22" diameter x 36" deep
25" diameter x 20" deep
25" diameter x 30" deep
25" diameter x 48" deep
28" diameter x 28" deep
28" diameter x 48" deep
28" diameter x 60" deep
33" diameter x 36" deep
33" diameter x 48" deep
38" diameter x 36" deep
38" diameter x 48" deep
38" diameter x 60" deep
43" diameter x 48" deep
48" diameter x 72" deep
60" diameter x 36" deep
60" diameter x 48" deep
60" diameter x 72" deep

# 100 SUPER-CYCLONE INSTALLATIONS ALREADY IN SERVICE

IMPORTANT NOTE: Like all other Lindberg developments, the Super-Cyclone has been thoroughly proved under 24-hour a day production conditions for a minimum of 12-months before announcement to the trade. Every effort has been made to restrict the sale of these units until the probationary period was completed. In spite of this, however, many of those who have seen the furnace in operation during the past 18-months have quickly been aware of its production possibilities and requested that units be constructed for them. Thus, over 100-Super-Cyclone installations are in service from coast to coast. One or more of these is near you, as is a Lindberg District Office, staffed by practical and competent sales engineers. The Super-Cyclone is not a cure all, nor do we represent it as such. It is speeding production, turning out straighter work, and cutting costs for many firms however, and we will be glad to survey its possibilities for you, on your work, at your request.

LINDBERG ENGINEERING CO • 2452 WEST HUBBARD ST • CHICAGO

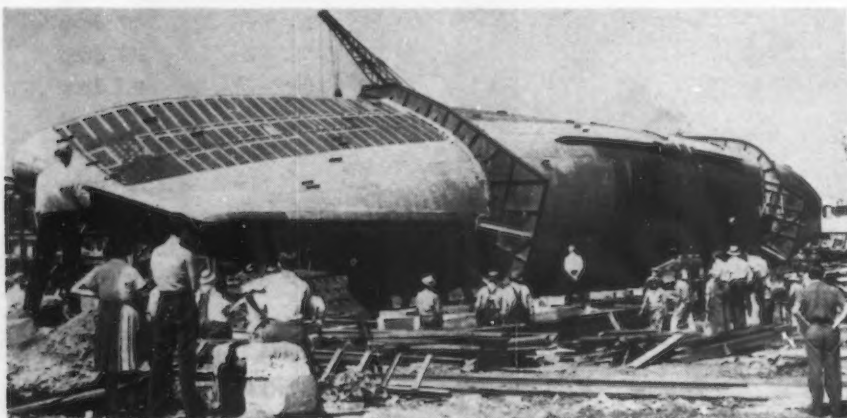
# G FURNACES

INDRYZING FOR SCALE-FREE AND DECARB-FREE HARDENING





**ROLLIN' OFF THE LINE:** The new, all-welded, 30-ton, M-4 tank is being turned out by Fisher Body Co., on an assembly line basis. The one in front was the first off the line.



**BUILT UPSIDE DOWN:** Defoe Shipbuilding Co.'s submarine chasers, built at Bay City, Mich., are being completed at the rate of a ship a week. By building the hull upside down and then turning it over, the ships can be completed at the rate of one a week rather than one every six weeks.

### Employers Called Too "Choosy" in Hiring

*Cleveland*

• • • Lack of foresight of some employers at Ohio defense plants was spotlighted here by the charge against employers made by B. C. Seiple, manager of the U. S. Employment Service and J. W. VandenBosch, statistician of the Chamber of Commerce, who both asserted that employers were still too "choosy" in hiring new men. As illustrations, Mr. Seiple cited that of 300 persons sent on order to an aircraft parts company here, only 15 were hired; of 65 persons sent to apply for positions as learners of various machine tools, only four got jobs; of 46 men sent to a machine tool company on order for common labor, only two were hired. These instances seem

to indicate, according to Mr. VandenBosch, that Cleveland concerns "might need a shock to bring them to" before they change their hiring practices, especially with regard to older men and to women.

### Midland Steel Products' 1941 Profit Is \$1,901,213

*Cleveland*

• • • Midland Steel Products Co. has made only "limited progress" in converting its facilities for use in war work, but it is negotiating for several war contracts, according to the company's annual report. Profit for 1941 after Federal tax deduction, was \$1,901,213 compared to \$2,269,590 for 1940. The decline was due to increased taxes and abnormal inventory adjustments.

### Aircraft Output in Midwest Rises Fast

*Chicago*

• • • On the Midwest war production front. Quietly and without ostentation, the Midwest is growing into an important aircraft production center which industrial leaders believe will be permanent. In three adjoining states there are now at least six huge engine plants—only one of which existed a year ago. In other nearby states there are propeller, engine, fuselage and wing plants now going full blast—all erected especially for and devoted exclusively to this one type of manufacture. There are others in production and more are slated for early construction, not counting the parts manufacturers who have been converted from peacetime production.

From the beginning of the defense program, the ordnance department has set out to make this area the ammunition cradle of the nation. In the seven states it controls, the Chicago ordnance district has released more ammunition contracts by far than any other district. Steel mills here are shipping the vast majority of their bar output for this purpose. Complete facilities from powder making through machining to loading blanket the Mississippi area.

Now the almost immediate Chicago area is ready to launch into the production of over 20,000,000 .30 and .50 cal. bullet cores a week under what appears to be the first practical plan developed by governmental agencies to help small plants convert to war production. The plan developed by Thomas Wynne, head of the Chicago office of Contract Distribution, offers aid by providing a special lathe to sell for around \$1,000; financing of the purchase of the lathe, and a guarantee that the bullet cores will be available for subcontracting. This complete "package" has brought approval from crippled small plants, garage shops, etc., for the operation of the machine can be mastered in less than two hours and the purchase price is within the reach of everyone. The fact that a lathe manufacturer has already started production of this special machine and that another lathe maker in an adjacent state will be making two

"war models" within another month indicates sharp upturn of machine tool output in this area for the idea will spread.

The letting of two contracts to this area last week for light rifles completes the Midwest's picture of small arms and ammunition manufacture. The area is growing rapidly in tank production, too.

Being the hub of the nation's railroad system, industrialists are aware that the roads' major need is not carbuilding materials as much as it is rails and locomotives. Railroad executives have told steel men here that shippers are unloading cars fast enough to meet demands, but the need for new rails occasioned by tremendous new plant construction plus normal replacement is getting serious. So, too, is the need for motive power since most of the big locomotive builders are war makers.

The tightness of steel is forcing plant contractors to specify reinforced concrete construction where possible instead of structural steel. A number of state bridges to be built of steel have lately been switched to wood.

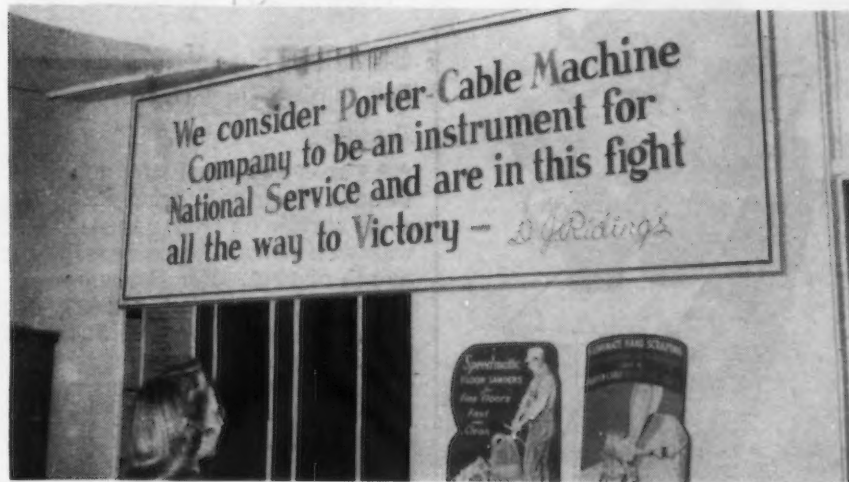
Farm implement makers are said to be cleaning up their '42 programs in preparation for almost full war conversion. Several companies have been granted permission to go over their monthly production quotas so far.

## Baldwin Has Backlog of 295 Locomotives on Order

Philadelphia

••• After delivery of 62 locomotives, steam, diesel-electric and electric, to American and foreign railroads, industries and governments in the first three months of 1942, the Baldwin Locomotive Works still had a backlog of 295 locomotives on its order books. Of these, 89 represent orders received since Jan. 1.

The current backlog includes orders for 203 steam locomotives, and 92 for electrics or diesel-electrics. Many of these are for foreign delivery, including railroads in Mexico, Bolivia, Colombia, Chile, Alaska and India. Others are for American manufacturing and mining companies, and the United States government.



### "BEAT THEIR BEST":

With this and other similar slogans, the Porter-Cable Co., Syracuse, N. Y., builders of machine tools, launched a campaign to speed up production for victory. The "B" boxes in the pictures are for suggestions and slogans, and an overseas cap to be worn in the shop was given each worker. "Special Award" gold stripes and stars will be attached to the cap as earned. Prizes are to be awarded workers who give the best replies each week to the threats and challenges hurled by enemy soldiers painted on bulletin boards.



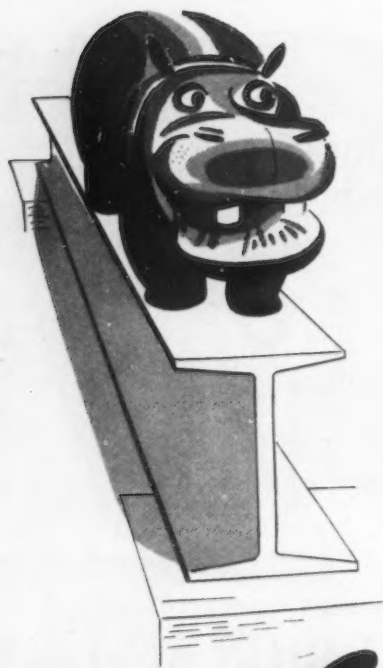
## Farrel-Birmingham Awards Contract for New Plant

••• The Farrel-Birmingham Co., of Ansonia, Conn., has awarded the general contract for the construction of its new plant in northern New York to the Turner Construction Co., according to President Nelson W. Pickering.

Plans by Thomas H. McKaig,

architect and structural engineer, provide for a one-story structural steel, brick and glass manufacturing building measuring 603 x 203 feet, with three cranes, together with an office building, powerhouse, and cafeteria. Beman and Candes are mechanical engineers. Estimated cost of the new plant in New York state has been placed at \$4,000,000.





**NO SAG**  
— IN RIGID,  
**ONE-PIECE,**  
**WESTINGHOUSE**  
**CS MOTOR**  
**FRAMES!**

... JUST  
**ANOTHER POINT**  
**WHERE THEY'RE**  
**YEARS**  
**AHEAD!**

J-21233



SEE PAGE — 8  
AND PAGE — 9

## Canadian Pig Iron Output Fell Slightly in February

Toronto

... Iron and steel production in Canada during February showed some shrinkage from January, but was well above the corresponding month of 1941. For February, pig iron output totalled 143,973 net tons, a daily average of 5143 net tons, compared to a January daily average of 5263 tons, and an average of 3646 tons per day in February, 1941. February's production included 117,424 tons of basic iron, of which 6263 tons were for sale; 13,790 tons of foundry iron, all for sale, and 12,759 tons of malleable iron, all for sale.

At the end of February, ten furnaces were in blast and one blown out for repairs. Blowing furnaces were located as follows: Dominion Steel & Coal Corp., Sydney, N. S., three; Steel Co. of Canada, Ltd., Hamilton, Ont., three; Algoma Steel Corp., Sault Ste. Marie, Ont., three and Canadian Furnace Co., Port Colborne, Ont., one.

Production of ferroalloys in February totalled 17,358 net tons

compared with 18,004 tons in the previous month and with 12,847 tons in February, 1941.

Steel ingots and castings output for February amounted to 242,921 net tons, compared with 259,016 tons in January and 193,422 net tons in February last year. Production for the month under review included 230,333 tons of steel ingots and 12,588 tons of direct steel castings.

## New Buffalo Shipbuilding Firm Given Navy Award

Buffalo

... A \$3,000,000 shipbuilding enterprise was announced this week when the Buffalo airport advisory board approved leasing of the city's marine airport to the Bison Shipbuilding Co., organized recently by officers of the Ernst Iron Works, Inc., and August Feine & Sons, both of Buffalo. The shipbuilding concern, it was said, has been assured a Navy contract for construction of an undisclosed number of small craft. The enterprise will employ about 300 skilled workmen.

## Relief from "M" and "L" Orders

INDUSTRY must observe the rules in doing business under the Priority System set up by the government for distributing vital material and equipment in wartime.

March 26, 1942

**THE IRON AGE  
PRIORITIES GUIDE**

*Prepared by the Priorities Staff of The Iron Age for use of industry and Government offices dealing with wartime controls of materials and machinery*

**FIFTH EDITION**

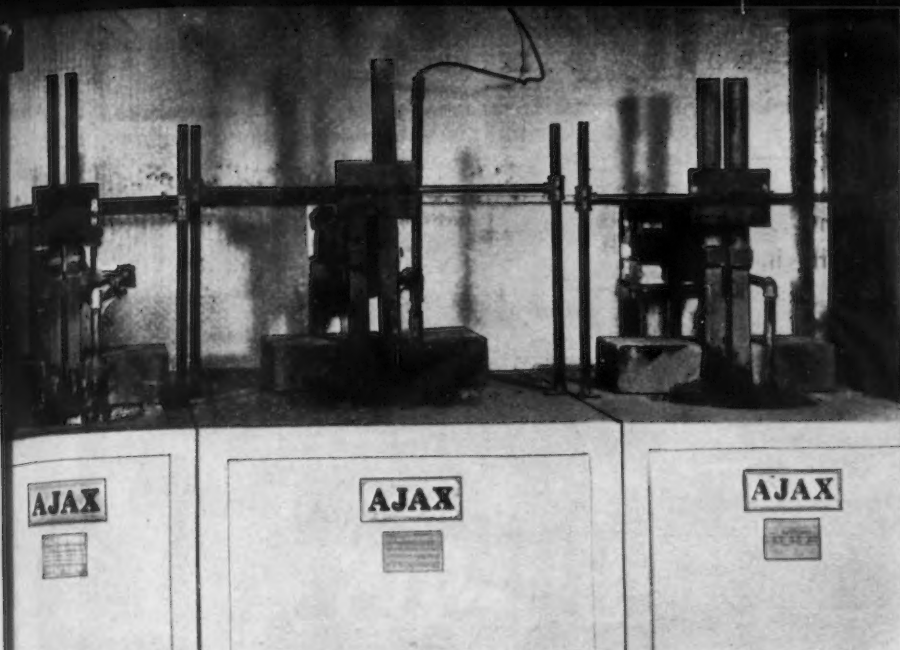
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**WARNING**  
To do business under wartime conditions in industry in the United States and Canada must keep itself informed as to the LATEST developments in Priority Controls.  
Please destroy earlier editions of The Iron Age Guide. Use only this FIFTH Edition.

**REVISIONS:** Each new revision for listing the Priorities and Allocation Guide up to date appears in The Iron Age. They are marked on the Priorities and Allocation Guide. See The Iron Age for complete details and interpretation of War Production Board orders affecting the metal industry.

THE IRON AGE, 100 E. 42nd St., New York, N. Y.  
(2nd edn. 1942)

from THE IRON AGE, 100 East 42nd Street, New York. Prices are: One to 10 copies, 25c. each; 11 to 100 copies, 20c. each; 101 to 300 copies, 18c. each, and 300 or more copies, 15c. each. (Please send stamps in payment for orders for less than four copies.)



American Twist Drill Co., Detroit, operates these Ajax furnaces 16 hr. a day, six days a week. After 19 months of continuous operation, their refractory type pots show no appreciable wear.

#### FEW OF THE COUNTRY'S BEST KNOWN AJAX USERS FOR HIGH SPEED STEEL TOOLS\*

Boeing Aircraft Co.  
Brown & Sharpe Mfg. Co.  
Commercial Steel Treating Co.  
E. C. Atkins Co.  
Ford Motor Co.  
Foster Wheeler Corp.  
General Motors Corp. (all divisions)  
Gov't Navy Yards: Arsenals  
Lapointe Machine Co.  
Landis Machine Co.

Morse Twist Drill & Machine Co.  
National Cash Register Co.  
National Lock Co.  
Pratt & Whitney  
Republic Steel Co.  
Simonds Saw & Steel Co.  
Talon, Inc.  
Thompson Products Co.  
Union Electric Steel Co.  
Union Twist Drill Co.  
Westinghouse Airbrake Co.  
Wesley Steel Treating Co.  
Whitman & Barnes



#### HERE ARE THE KEY PROCESSES TODAY...

CARBURIZING  
SIMULTANEOUS BRAZING  
& CARBURIZING  
NEUTRAL HARDENING  
CYANIDE HARDENING  
SELECTIVE HEATING  
AGE HARDENING  
TEMPERING  
HARDENING HIGH-SPEED  
STEEL TOOLS  
ANNEALING  
BRAZING  
HEATING FOR FORGING

In considering equipment, it is well to recall that *preferred practice*—itself a basic factor which has made possible the adoption of molybdenum high speed steels—is beyond question the Ajax electric salt bath furnace method of hardening...

Specific reasons why the country's high-production plants\* use Ajax-Hultgren furnaces are these:

1. The method eliminates scaling, oxidation, surface decarburization,
2. The method eliminates the need for

skilled labor and all elaborate precautionary measures required with other means,

3. By actual tests, the life of tools hardened in an Ajax furnace is increased from 25% to 300% over previously conventional practices.

These outstanding advantages are due to the unique principle of internal heating and automatic circulation of the bath which insures temperature uniformity to within 5 deg. F.

**AJAX ELECTRIC COMPANY, Inc.**  
900 FRANKFORD AVE., PHILADELPHIA, PA.

**AJAX CATALOG GIVES DETAILS, DIMENSIONS, ETC. WRITE FOR IT TODAY**

## "THE PREFERRED PRACTICE FOR HARDENING HIGH SPEED STEELS"

REASON ENOUGH WHY LEADERS\* CHOOSE AJAX:  
... simple immersion heat treatment in Ajax salt bath furnaces makes the whole process fool-proof and trouble-free in any plant...

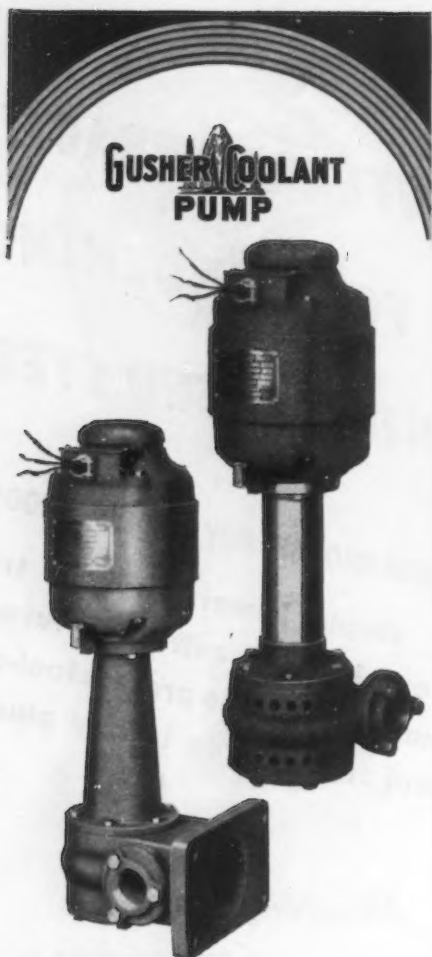
WRITE FOR COMPLETE LIST OF USERS!



## THE **AJAX** ELECTRIC SALT BATH FURNACE HULTGREN

**ASSOCIATE COMPANIES:** AJAX METAL COMPANY, Non-Ferrous Ingot Metal for Foundry Use  
AJAX ELECTRIC FURNACE CORPORATION, Ajax-Wyatt Induction Furnaces for Melting  
AJAX ELECTROTHERMIC CORPORATION, Ajax-Northrup Induction Furnaces for Melting, Heat-Treating





## KEEP your Machine Tools YOUNG!

Don't let the steady flow of defense work in your plant be tied up by a tardy machine tool. Insure the satisfactory and continuous functioning of your machines by using Ruthman Gusher Coolant Pumps.

They really do a good job—so much so that they are now standard equipment on many well-known machine tools. Therefore specify Ruthman Coolant Pumps—the pumps that keep your cutting tools young.



**ADHESIVE PREVENTS SPLINTERING:** To prevent splintering of glass in the event of a bombing and at the same time to promote the sale of war bonds and stamps, Columbian Steel Tank Co., Kansas City, is taping the windows of its main office building in the above manner.

### Canada Tightens Controls on Fencing, Tool Steel, Gages

Ottawa

••• Further restrictions on manufacture of non-essential products in which steel is the principal component, and new regulations governing imports of steel and equipment have been announced by the Canadian Steel Controller and Department of Munitions and Supply.

By agreement with manufacturers, the production of all chain link fencing will be stopped in Canada on April 30, and no sales will be made by fabricators after May 31.

Unlicensed importation of any high-speed steel, carbon tool steel or alloy steel from the United States is forbidden, the steel controller has announced. This action is proposed to overcome shortage of strategic alloys used to provide the cutting qualities of tool steel.

### Bristol Acting Chief of WPB Safety Branch

Washington

••• William M. Bristol, Jr., chief of WPB's health supplies branch, has been named acting chief of the safety and technical equipment branch, succeeding Herbert T. Rosenfeld. Mr. Bristol is vice-president and director of the Bristol Meyers Co., Westfield, N. J.

### Goodrich Ready to Produce Ameripol Synthetic Rubber

••• B. F. Goodrich Co.'s laboratories have completed successful tests and are now ready to go into production of Ameripol hard sponge rubber, the company announces. This synthetic rubber is said to be resistant to oils and greases. It is light in weight, can be sawed or drilled, has good acoustic properties, and does not show injury after prolonged subjection to heat of 158 deg. F. It can be produced in slab or molded form. A mechanical pressure of 225 lb. per sq. in. does not harm its cellular make-up, Goodrich reports.

### Alcoa Plant to Get E

Pittsburgh

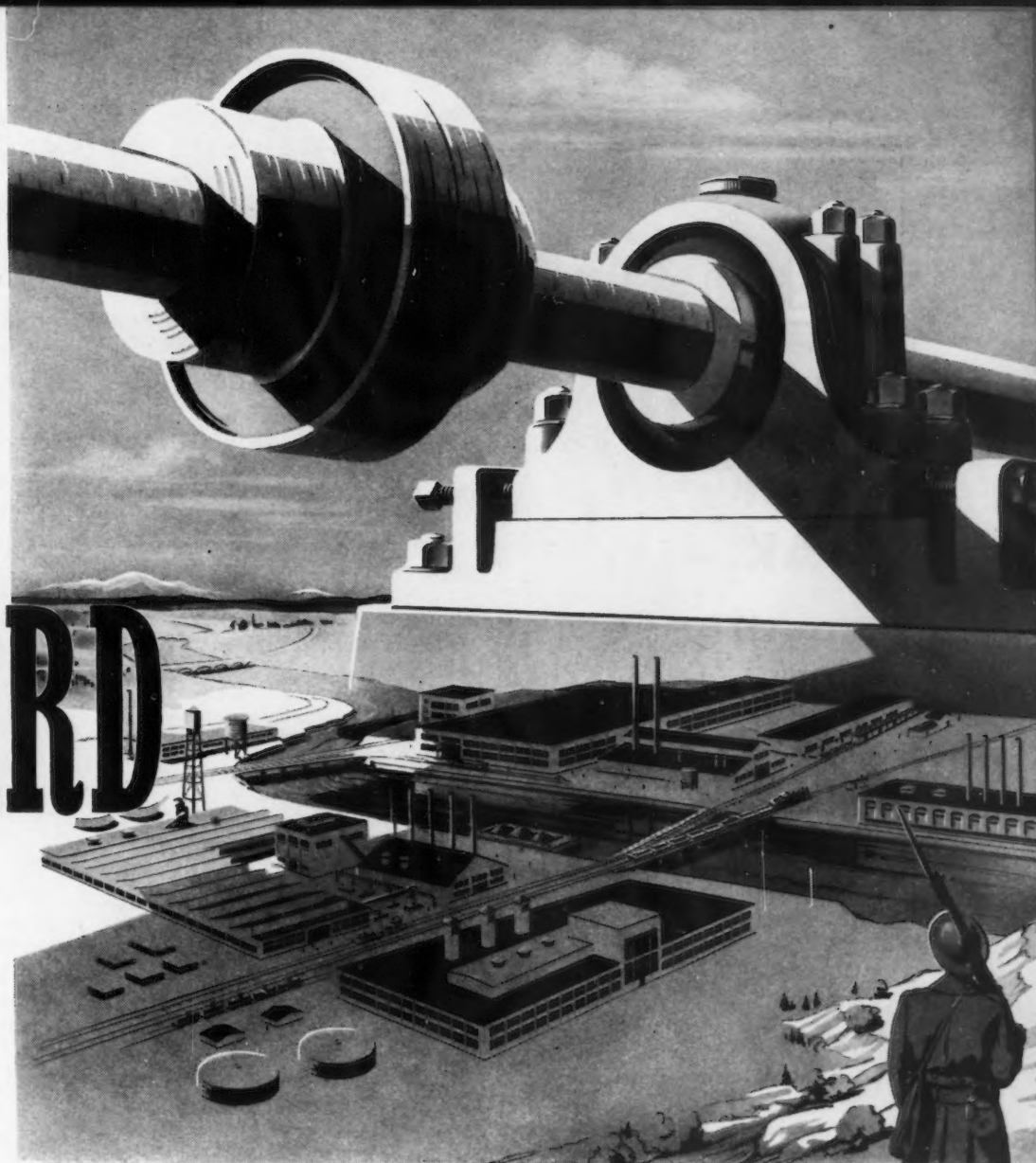
••• Aluminum Co. of America's New Kensington works will receive the Navy E pennant on April 14 for excellence in production of Navy materials. Each employee will be awarded a gold and white button.

### E Given to Battery Firm

••• On March 28 Rear Admiral W. C. Watts, representing the Secretary of the Navy, presented the Navy E pennant to R. C. Norberg, president of the Electric Storage Battery Co. This was the first such award made in Philadelphia.

# ON GUARD

... against  
Power Loss  
-a Saboteur  
of Production



**V**ICTORY on far-flung battle fronts begins with the will-to-win at home . . . in mine, mill or factory . . . with every turn of shaft, wheel, or gear . . . with positive assurance of high speed, continuous production . . . with no time for anything short of the most efficient methods for producing the material for men in combat.

Power transmission — the vital link between the machine and the source of energy that gives it productive capacity—must be uninterrupted . . . free of waste, power leakage, time-consuming breakdowns . . . other "saboteurs" of production. Dodge-Timken Rolling Bearings — which include more than eighteen hundred types and sizes—are a quick, sure, and economical answer to many power transmission problems—part of the Dodge complete line available in all industrial centers.

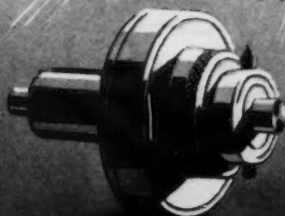
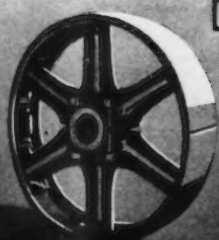
Each is designed and built for a life expectancy of 30,000 hours under conditions for which it is adapted. High speeds . . . shock loads . . . heavy, medium, and light duty . . . dust . . . water . . . heat . . . fumes . . . all of these and all other conditions encountered in industrial operations are fully provided for in the Dodge 30,000-hour line.

It's comparatively easy to modernize equipment and drives from the Dodge complete line of pillow blocks and unit mounts. Write for simple, non-technical selection tables which take the guesswork and uncertainty out of bearing selection for any service.

**DODGE MANUFACTURING CORPORATION**  
Mishawaka, Indiana, U. S. A.

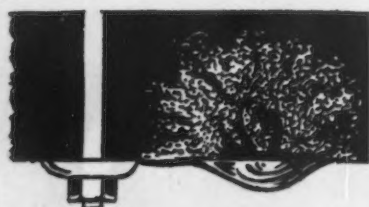
# DODGE

MISHAWAKA



THE RIGHT DRIVE FOR EVERY JOB





**AVOID  
TANK  
LEAKS.**

**Install  
seamless  
one piece**

**HAVEG  
MOLDED PLASTIC  
TANKS**



**O.K. for**

- ✓ acids commonly used in pickling
- ✓ rapid temperature changes
- ✓ temperatures up to 265° F.

Seamless...one piece units up to 13' long

**Standard Sizes  
of  
RECTANGULAR TANKS  
CYLINDRICAL TANKS  
PIPE  
PIPE FITTINGS  
VALVES  
FUME DUCT**

Send for technical data bulletin  
F23

**HAVEG CORP.**  
NEWARK, DELAWARE

## Automotive Council Groups Name Governing Boards

*Detroit*

• • • Five product divisions, established by the Automotive Council for War Production, have organized permanent governing boards, each composed of production men from companies engaged in making war items. In addition, the Council reports that a separate group is being established for makers of small arms, while major progress in expediting the war effort is being made by the Machine Tool and Equipment Service and the Tooling Information Service of the Council.

The governing boards for the five Product Divisions in operation are:

1. Aircraft Engines—R. N. Brown, Packard Motor Car Co., chairman; J. W. Hines, Studebaker Corp.; G. H. Bernard, Nash-Kelvinator Corp.; W. R. Gerber, Chrysler Corp.; N. L. Bean, Ford Motor Co.; R. J. Beebe, Cadillac Motor Div.; General Motors Corp.; E. R. Jacoby, Continental Motors Corp.; Hugh Dean, Chevrolet Motors Div.; C. A. Chayne, Buick Motors Div.

2. Airframes—C. E. Bleicher, Chrysler Corp., chairman; W. DeGroat, Ford Motor Co.; R. J. Scanlon, Hudson Motor Car Co.; A. J. Wettlaufer, Briggs Mfg. Co.; L. C. Hill, Murray Corp. of America; R. W. Clark, Hayes Mfg. Corp.; E. W. Higgins, Woodall Industries, Inc.; A. J.

Fisher, Fisher Body Div.; William C. Potthoff, Goodyear Aircraft Corp.

3. Ammunition—E. A. Clark, Budd Wheel Co., chairman; P. C. Booty, International Harvester Co.; G. F. Keyes, Mullins Mfg. Co.; L. W. Klein, Gabriel Steel Co.; K. C. Plasterer, Olds Motor Div.; William Steinwedell, Stewart Warner Corp.; H. Swanson, Falls Spring & Wire Co.; S. D. Den Uyl, Bohn Aluminum & Brass Corp.; H. E. Mead, Bowen Prod. Corp.

4. Tanks, Armored Cars and Parts—Del S. Harder, Fisher Body Div., chairman; Henry Ensign, American Car & Foundry Co.; Dale Roeder, Ford Motor Co.; Jean Arnold, Cadillac Div.; M. C. Evans, International Harvester Co.; R. E. Ward, Mack Mfg. Corp.; R. J. Emmert, Yellow Truck & Coach Mfg. Co.; E. J. Hunt, Chrysler Corp.

5. Artillery—N. F. Hadley, Chrysler Corp., chairman; D. K. Badetscher, Hudson Motor Car Co.; J. F. Wolfram, Olds Motor Div.; E. R. Pettengill, Pontiac Motor Div.

## Rust Furnace Co. Gets New Contracts

*Pittsburgh*

• • • The Rust Furnace Co. has been awarded furnace contracts totaling \$550,000 by two plants in this area. The contracts comprise 18 car-type furnaces for heat treatment of castings and five car-type furnaces for heat treatment of rolls.

The furnaces will represent expansion of production capacity at each plant, Rust Co. officials said.



**SCRAP FOR EUROPE:** Bales of metal from scrapped cars, ready for shipment to Europe where they will be made into war implements for the United Nations.

# LATROBE

## MOLYBDENUM HIGH SPEED STEELS

DOUBLE-SIX  
TATMO  
TNW  
HV-6  
CO-6

For the tools of Victory

Latrobe's Molybdenum-Type High Speed Steels have been thoroughly perfected to meet today's varied and exacting cutting applications with increased toughness, improved efficiency and lower cost! • We can help you select the correct Molybdenum Type to best serve your particular requirements. Write.



*Latrobe* **ELECTRIC STEEL COMPANY**

MAIN OFFICES *and* PLANT ... LATROBE • PENNSYLVANIA





**NO MAGIC**  
—ABOUT  
**THE LONG LIFE THAT  
MOTOR USERS GET  
WITH WESTINGHOUSE  
CS MOTORS —  
SIMPLY  
SEALED SLEEVE  
BEARINGS.**

**...JUST ANOTHER REASON  
WHY WESTINGHOUSE  
MOTORS ARE  
YEARS  
AHEAD!**



SEE PAGE — 8  
AND PAGE — 9

## Labor, Shipping Shortages Presage Coal Scarcity

Pittsburgh

... Unless a substantial number of industrial coal consumers stock up as rapidly as possible so they will have enough supplies to prevent shortages when the movement to the Lake regions reaches its peak later in the year, the nation at that time will face an acute deficiency of coal in various locations, according to informed opinion here.

Some Pittsburgh concerns producing coal have already been warned that some of their output must be shipped to New England where supplies are badly needed because of disruption of coast-wise shipping. In addition to these impending or actual allocations, western Pennsylvania coal operators are being flooded with inquiries from the East. This demand comes at a time when Pennsylvania and Ohio coal producers are meeting heavy requirements of their regular consumers. It is expected that coal operators will ship an unprecedented tonnage to the Lakes this year in order to tide western consumers over next winter when demand for industrial coal will probably reach an all time high.

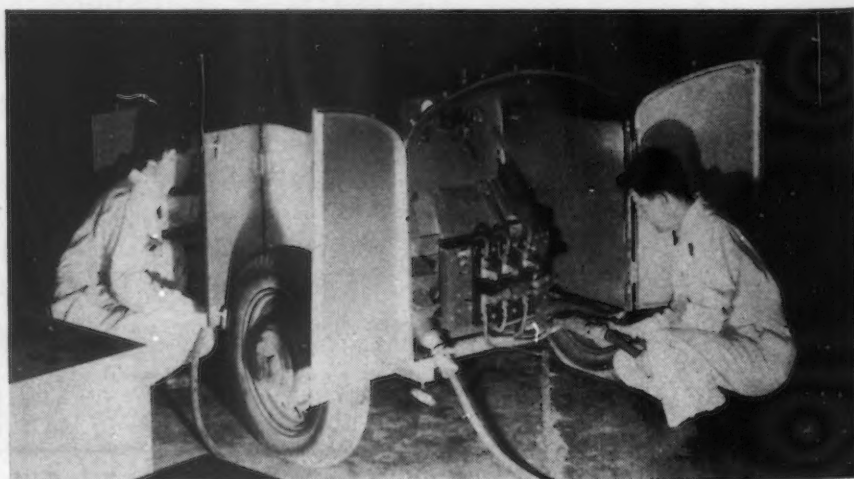
In addition to the difficulties occasioned by transportation problems, practically every large coal operator has had to face a labor situation strongly reminiscent of

World War No. 1 days. There have been several instances recently of actual and acute shortage of miners, owing to the draft and a movement of employees to other lucrative positions. Actual efficiency and output per man has been affected substantially in the past two months, with many mines producing less coal than they were a year ago. It is expected that these conditions, which recently resulted in a newspaper advertisement here for 100 miners, are bound to get worse before they get better, all of which will contribute to a further tightening in the nation's coal supply.

## Columbia Steel Will Add Capacity for Raw Steel

... Columbia Steel Co., subsidiary of United States Steel Corp., has announced additions and improvements to its Pittsburgh and Torrance, Cal., plants. The expansion program, which will provide additional open hearth and electric furnace capacity as well as alterations and improvements in finishing facilities, will be undertaken entirely with the corporation's own funds at an estimated cost of \$8,500,000. The additional expansion of Columbia's steel making facilities will complete U. S. Steel's part, amounting to more than one-third, in the 10,000,000-ton steel ingot expansion program recommended last year by government defense authorities.

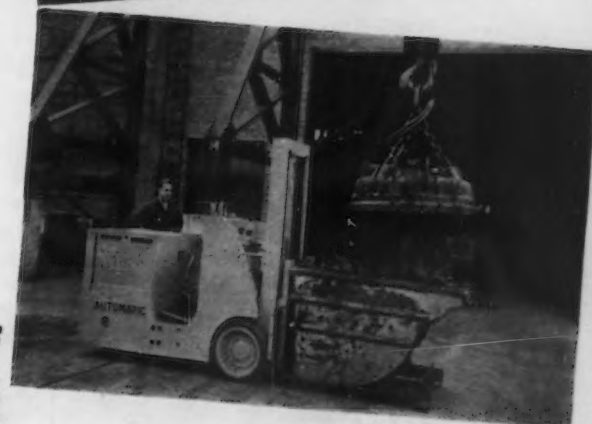
**WELDER STARTS AIRPLANE ENGINES:** In addition to using arc welders to fabricate aircraft parts, Pan-American Airways is using them to provide power for starting engines of its Clipper ships. Because battery carts have to be frequently recharged, this General Electric welder, mounted on a trailer, has been found more satisfactory. It supplies power at 24 to 28 volts from the airport's electric power supply.



TRADE

**AUTOMATIC** MARK

MANUFACTURERS FOR OVER 30 YEARS

*Electric Propelled* **INDUSTRIAL TRUCKS**

## "AUTOMATIC" Fork Truck System keeps vital materials moving through production in forge plant

The scenes as illustrated, show the diversified application of "AUTOMATIC" Fork Truck System in a large forge plant.

The varied operations as required, include transportation and stacking of 6000 lb. skidloads of forgings such as crankshafts, connecting rods, etc., to and from annealing ovens. Also the transportation of forging blanks from yard crane magnet to electric furnaces and the removal of scrap in special hoppers fitted for fork truck operation.

All this requires a flexible handling system which "AUTOMATIC" Fork Trucks provide with highest efficiency and at lowest cost.

Let the "AUTOMATIC" representative show you how "AUTOMATICS" can be used to get the best materials handling results.

## AUTOMATIC TRANSPORTATION CO.

Div. of The Yale &amp; Towne Mfg. Co.

75 W. 87th STREET

CHICAGO, ILL.

### AUTOMATIC MATERIAL HANDLING EQUIPMENT

FOR EVERY PLANT TRANSPORTATION REQUIREMENT. Fork and Ram Trucks - Coil Handlers - Paper Handlers - Low and High Lift Trucks Load Carriers, Tractors, Cranes.

"WHERE TO BUY IT"

### AUTOMATIC

### *Representatives*

are listed in the classified telephone directories in principal cities and industrial areas under "TRUCKS, INDUSTRIAL" where this trade mark heading appears.

WHEN YOU BUY TRUCKS - - Buy "AUTOMATIC"



# G. A. WELDING *Shop Notes*

## CAMERA FIENDS

Photography has a big responsibility in the Plate and Welding Division of General American Transportation Corporation. Many essential tests are made with X-ray and photomicrographic equipment. G. A. laboratory technicians use pictures, too, in the continuous research to keep "Fluid - Fusion" Welded Vessels always the leaders for strength, efficiency, and maximum service.



PLATE AND WELDING DIVISION  
**GENERAL AMERICAN  
TRANSPORTATION**  
CORPORATION



*British-Combine Photo*  
**RUSSIAN ANTI-AIRCRAFT:** Here is a crew of an anti-aircraft machine gun ready to open fire from a street in Moscow during a recent German bomber attack.

### South Bend Lathe Works Issues New Operators' Manual

• • • To increase effectiveness of lathe operators' handbook for defense training purposes, the South Bend Lathe Works, has just issued the 41st edition of the book, "How To Run A Lathe." A number of changes in text material and illustrations have been made since the previous edition was printed in 1941.

This book covers such subjects as the operation of the lathe units, grinding cutter bits, making accurate measurements, plain turning, chuck work, taper turning, boring, drilling, reaming, tapping and cutting screw threads. It is used as a text in schools and apprentice training courses. This edition contains 128 pages and over 365 illustrations. Copies are available for 25c., post-paid.

### Ohio Steel Foundry Gets Uniquely Ventilated Plant

• • • Construction of a new building for the Ohio Steel Foundry Co., at Lima, Ohio, started in mid-March. Huge, sliding roof vents, motor-driven and traveling on standard railroad rails, are among the innovations that have been incorporated in its design. In summer the unique vents will remain open while the plant is in operation, thus providing abundant ventilation and light. In winter, ventilation will be supplied by large fans, mounted directly in the centers of the vents.

### Alcoa Nets \$40,882,134, Down 12.1% From 1940

*Pittsburgh*

• • • For the year ended Dec 31, 1941, the Aluminum Co. of America reported net earnings of \$40,882,134, equivalent to \$22.90 a share on common stock, down 12.1 per cent from the adjusted net income for 1940 of \$46,522,471. The decline in net earnings is attributed to increased taxes, rising costs of production and manufacture, and a 2c. a lb. reduction in the base price of aluminum ingot.

It was estimated that in slightly more than a year, the production rate attained in the preceding 50 years was more than doubled.

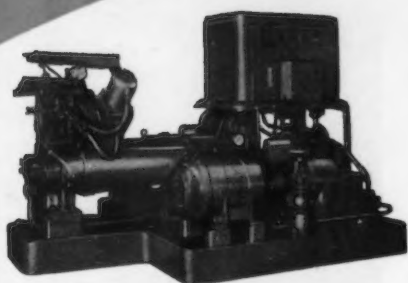
Since March 14, 1940, four price reductions have been made, bringing the price of aluminum ingot from 20c. to 15c. a lb. The last decrease in price, made in September, 1941, was especially beneficial to the government since nearly the entire output of the nation went into war work.

The report stated that the company's own plants and those leased from the government will, during the coming year, produce more aluminum than Germany and all conquered nations together.

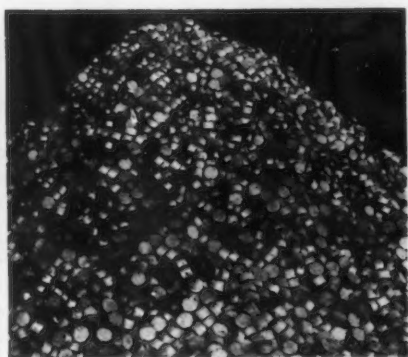
### Cleveland Firm Gets Navy E

• • • Reliance Electric & Engineering Co., Cleveland, O., was awarded the Navy E on March 24 by Rear Admiral William C. Watts. The 1300 employees of the company each received a gold emblem with the legend "For Production."

# Conserve National Resources



Small Milwaukee Press with a capacity up to 2 tons of briquettes per hour.



Cast iron briquettes from a Milwaukee Press. Handled with magnet to material yard, ready for remelting in the cupola. Note uniformity.

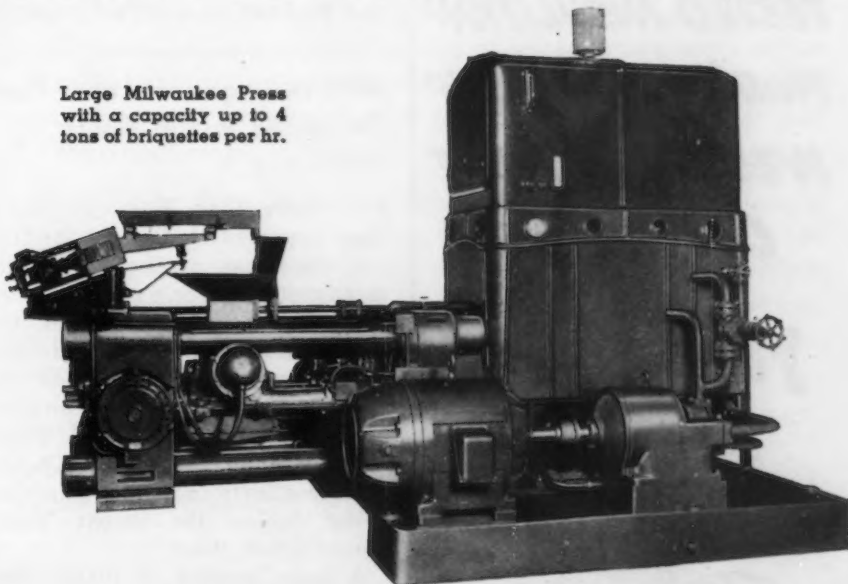
**BRIQUETTING:** 1. Replaces higher price scrap. 2. Permits better metal control. 3. Reduces melting loss. 4. Conserves space.



## Help the Cause of National Defense by **BRIQUETTING** Borings and Turnings the Modern Milwaukee Way

Today—more than ever before—it's necessary to reclaim good, usable material from metal scrap. Why not do it the modern Milwaukee way? Melt borings and turnings in a briquetted form. It enables you to salvage the highest percentage of materials and to effect substantial savings in melting costs. It also makes you independent of the scrap market.

Milwaukee Hydraulic Briquetting Presses convert metal swarf of all kinds into solid metal briquettes that replace the highest grades of metal scrap. The presses are being used by the nation's leading manufacturers. Five sizes available. Write for literature.



Large Milwaukee Press with a capacity up to 4 tons of briquettes per hr.

**CHECK YOUR TONNAGE**—Determine how much metal scrap you can reclaim annually. Our engineers will gladly assist you. Write us—today.

### MILWAUKEE FOUNDRY EQUIPMENT CO.

3238 WEST PIERCE STREET • Cable Address "MILMOLDCO" • MILWAUKEE, WISCONSIN

A3616-1PC





**TUFFERNELL!**

**—THAT'S**

**THE IMPROVED,  
RADIO-FREQUENCY**

**TESTED INSULATION**

**THAT'S HELPED KEEP**

**WESTINGHOUSE**

**CS MOTORS**

**YEARS  
AHEAD!**

J-21275



SEE PAGE — 8  
AND PAGE — 9

## SWOC Convention At Cleveland May 19-22

*Pittsburgh*

••• The third international convention of the Steel Workers Organizing Committee will be held in Cleveland, May 19, 20, 21 and 22.

The convention plans to adopt a constitution, elect officers, adopt a wage policy to provide a basis for negotiating future wage agreements, and make plans to organize the entire steel industry in the United States and Canada.

Local unions will elect delegates. Each delegate shall have one vote for each 100 members or less and one additional vote for each 100 member, or majority fraction thereof but no delegate shall have more than 10 votes. Previous SWOC conventions were held in Pittsburgh in 1937 and Chicago in 1940.

At present the SWOC is functioning as an organizing committee, with rules and methods of procedure to guide it. The forthcoming convention will establish the union as a constitutional organization.

Philip Murray, SWOC head, may not be in the running for president of the new union setup because of press of duties at Washington and as CIO head, as reported recently.

## WPB Management-Labor Plan Organized in 100 Plants

*Washington*

••• More than 100 war plants have reported to Donald M. Nelson, chairman of the WPB, that management-labor production drives have been organized, the WPB has announced. Previously, Mr. Nelson personally cited the management-labor production committee in the Batavia, N. Y., plant of the Doehler Die Casting Co. for "heroic efforts to keep production going during the recent Tonawanda Creek flood."

A large number of plants that earlier devised their own plans for increased war output have notified Mr. Nelson they are adapting their plans to the official national plan. The first plant to report organization under this plan was that of the Ajax Engineering Co., Chicago.



*Harris & Ewing Photo*

**500 LB. OF DESTRUCTION:** Ready for shipment from a Philadelphia bomb manufacturing plant, this 500 lb. demolition bomb is getting a final inspection. Fins were attached for the photograph and bands around the bomb facilitate in handling. Bomb fins are attached at the air fields, since even a slight bend in them would destroy the bombs accuracy in descent.

## Defense Training Classes Opened to Women

*Indianapolis*

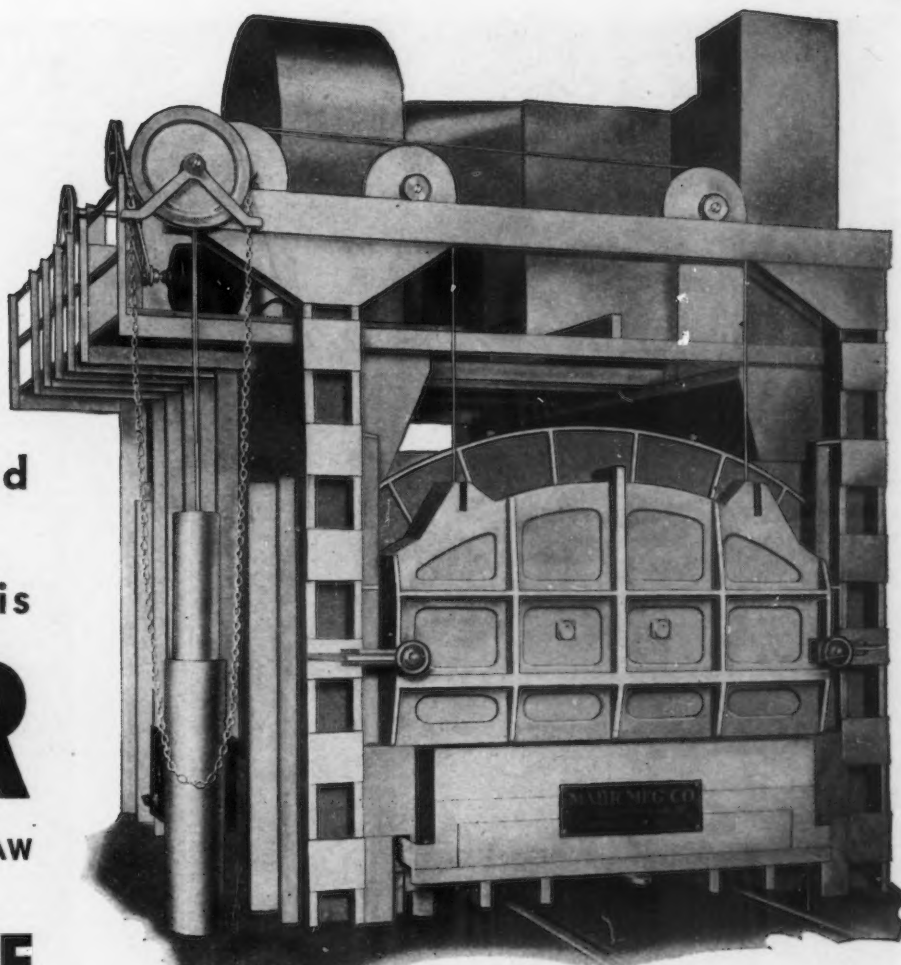
••• All defense training classes of the public schools here have been opened to women. A course in parts inspection is equally divided between 160 women and men, 80 of each having been selected from U. S. Employment Service rolls. In the machine shop courses, women will attend the classes six hours daily. Since June, 1940, the public schools have trained about 18,000 for war production.

Many new . . . and  
**EXCLUSIVE**  
features make this

# MAHR

RECIRCULATING • AIR DRAW  
STRESS RELIEF

## FURNACE



of immediate interest to Defense Plants!

### MAHR

is making astonishingly prompt deliveries on heat treating equipment of all kinds, due to our large trained personnel and manufacturing facilities. For over 25 years, the name MAHR has represented the most advanced and efficient designs in furnaces of all kinds.

Insures rapid and uniform heating through the use of large volumes of recirculated air . . . Recirculating fans of insulated alloy construction are so placed that long duct runs are eliminated, thus giving close connections for duct work and making possible close control of dampers for recirculation and air intake for cooling cycles.

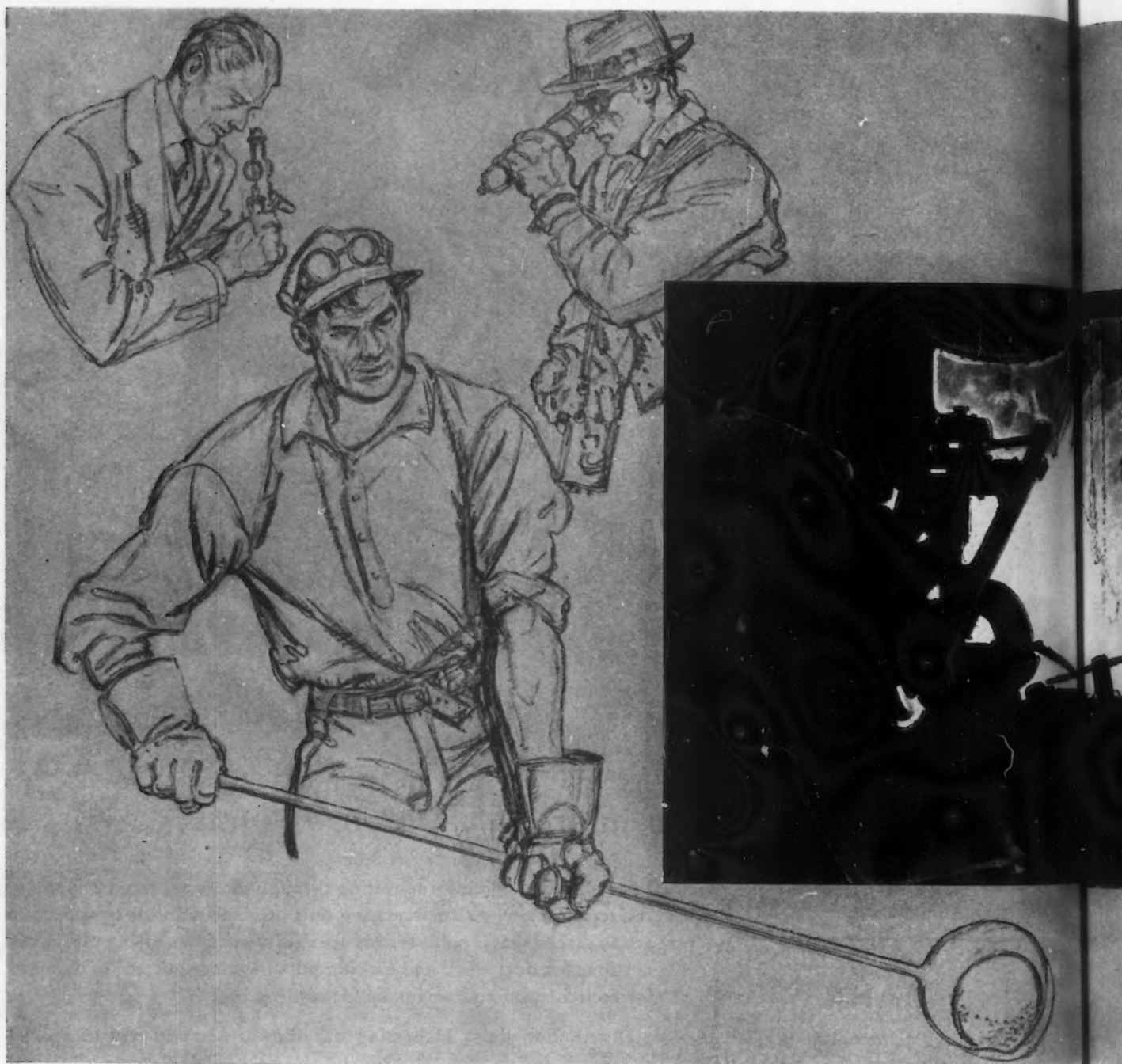
Distribution ducts in heating chamber are constructed of special refractory design, thus eliminating the necessity of costly alloy and reducing maintenance costs . . . All of the features of MAHR standard car type construction are incorporated in this furnace, assuring the use of a unit with rugged construction, efficient operation and long service-life.

**WRITE US TODAY** for bulletins and detailed information on any furnace installation. Car bottom, batch, continuous, rotary, annealing, carburizing, stress relief, nitriding, etc. Atmosphere generators.



**MAHR MANUFACTURING CO.**  
DIVISION OF DIAMOND IRON WORKS, INC.  
MINNEAPOLIS, MINNESOTA, U. S. A.



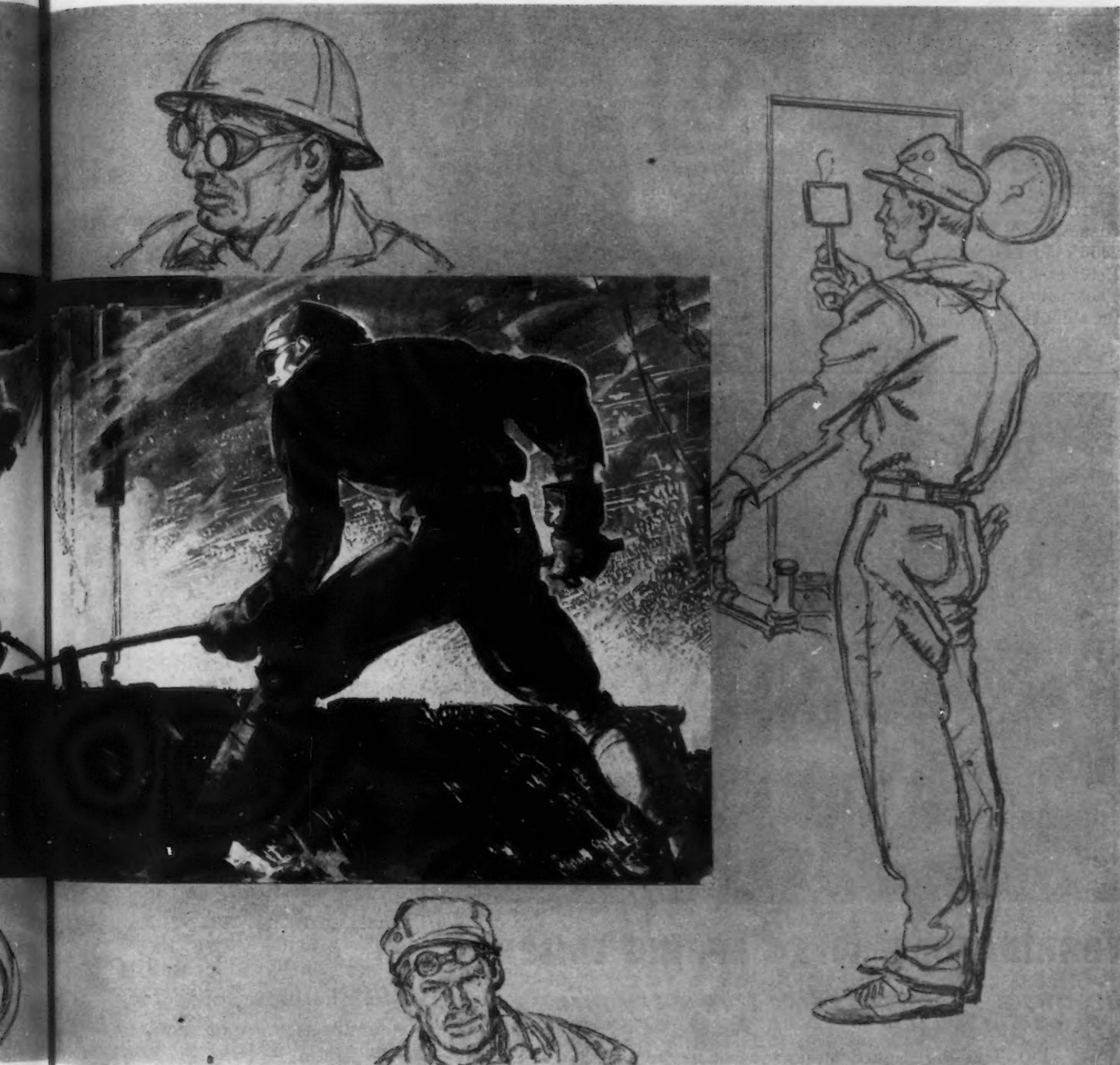


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# MEN OF STEEL HELP FIGHT THE WAR

Around the clock, twenty-four hours a day, seven days a week, the thousands of men at J&L are turning time into steel and more steel to arm our fighting forces. With their *will to do*, they are making new high records in steel production.

These gains that help step up our fighting power for the battles ahead are made by men and management who realize the price that must be paid to assure our freedoms. The individual skills these men employ are those of free men working in a spirit of free enterprise. They know what we are fighting for — many of them are sons and



FROM AN ORIGINAL DRAWING AND SKETCHES BY ORISON MACPHERSON

grandsons of men who came to America that they and their children might be free. They know what it takes to win — many of them fought in 1918. They know that production *today* backs up their sons and brothers and your sons and brothers in the war.

In this spirit, men of steel help fight the war. They fight it in the mines and quarries, on the Great Lakes, on the rivers, the railroads, at the coke ovens, the blast furnaces, the steel works, the blooming and finishing mills. They fight it by processing raw materials into booming, fiery steel — working the last full pound from the materials and machines under their command — speeding more and more steel, day and night, on its way to war.

## JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS  
PITTSBURGH, PENNSYLVANIA



PARTNER TO INDUSTRY  
IN WAR PRODUCTION

THE IRON AGE, April 9, 1942—113



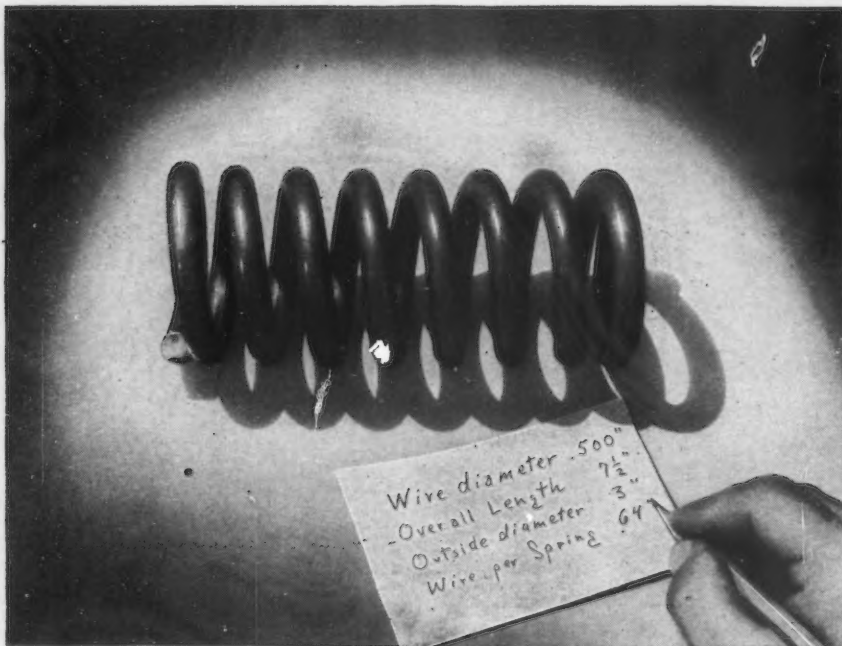
## Railroad Iron and Steel Purchases Up 44% in 1941

Washington

••• Under the stimulus of defense mobilization, 1941 saw a sharp rise in iron and steel purchases by Class 1 railroads, to \$456,147,000 from \$315,048,000 in 1940, an increase of \$141,000,000. These figures were disclosed by President J. J. Pelley of the Association of American Railroads who

said 1941 purchases of fuel, materials and supplies, aggregating \$1,161,274,000, an increase of \$306,811,000 over 1940, were greater than in any year since 1929, when purchases amounted to \$1,329,535,000.

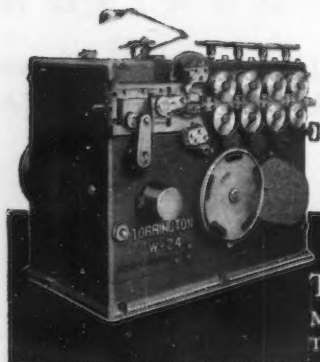
The largest category of steel purchases last year consisted of locomotive and car castings, beams, etc., the total being \$67,501,000. Ranking second were rail purchases, which amounted to \$52,234,000.



## TORRINGTON'S W-24 SPRING COILER produces 22 springs like this every minute!

This high speed means lower costs for springs of exceptional accuracy of wire length, coil diameter and pitch.

High speed production and uniformly accurate springs are features of each of Torrington's 13 spring coilers which have a range for production of extension, compression and torsion springs in any wire diameter from .003" to .500".



For details of both segment and clutch type coilers write

**THE TORRINGTON**  
MANUFACTURING COMPANY  
TORRINGTON, CONNECTICUT



**THEY KNOW MACHINES:** Commander C. E. Olsen, Navy service school officer accompanies Fred Gillies, general superintendent of Inland Steel Co., on an inspection tour of the machine shop at Great Lakes Naval Station. In addressing the latest graduating class Mr. Gillies remarked that he supposed the Navy still has rumors, adding that such rumors—now known as scuttle-butt—ran about 5 per cent accurate.

## Canadian Firm Licensed to Make Rexalloy Tipped Tools

••• License to manufacture Rexalloy tipped tools by the patented process described in the article, "cutting Tools Tipped with High Speed Steel," which appeared in the March 26 issue of THE IRON AGE, page 53, has been granted to the Oshawa Engineering Co., Oshawa, Ont. The license covers the sale of these tipped tools in the Dominion of Canada and was granted by the General Tool & Die Corp., 62 Franklin Street, East Orange, N. J.

## Indianapolis Trains Grinders Indianapolis

••• Specialized training in precision grinding for workers in local defense plants started here April 1 under the supervision of Purdue University.

## Steel Employees at 651,000 in February

• • • Employment in the steel industry during February continued at the high level reached in January, according to the American Iron & Steel Institute. A total of 651,000 employees was at work in the industry during both January and February, or 8 per cent more than the total of 603,000 employed in February, 1941.

Because of the shorter month, February steel payrolls of \$108,563,000 were down from the January total of \$118,785,000, but were more than 20 per cent above the total of \$89,586,000 disbursed by steel companies in February of last year.

## Du Pont Announces New Electrofinning Process

Wilmington, Del.

• • • A new electrolytic tinning process, known as the Halogen Tin Process, for plating strip steel was announced by the Electroplating Division of E. I. du Pont de Nemours & Co. The process, employing a neutral solution said to eliminate sludging and consequent waste of tin common to many electrofinning methods, will conserve both tin and electric power, it is claimed.

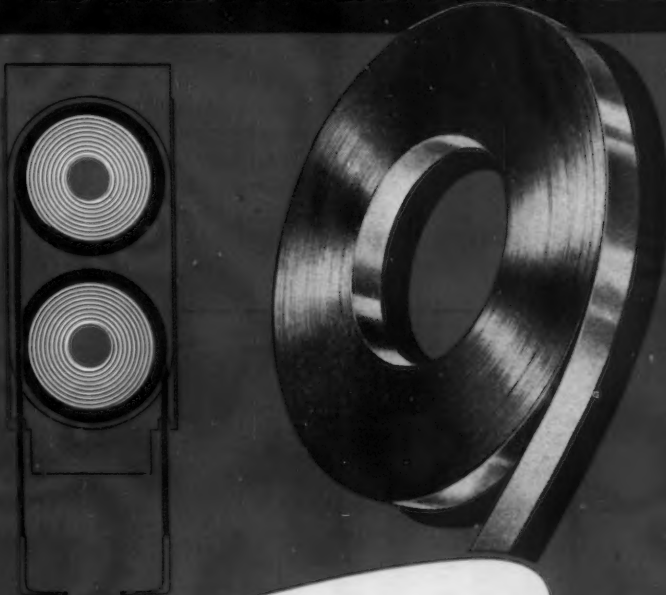
A thinner, more uniform tin coating can be applied to the strip steel by this method than by the "alkaline" electrofinning method now in use or the "hot dip" process. Tin deposited by the Halogen process, it was stated, can be heated without discoloration either when the plate is heated to obtain the bright finish required by some can manufacturers or when heated during the process of applying lacquers or enamels.

## Belsley is Appointed WPB Executive Secretary

Washington

• • • G. Lyle Belsley has been appointed Executive Secretary of the WPB. He succeeds Herbert Emmerich, who was appointed Commissioner of the Federal Public Housing Authority. Mr. Belsley has been assistant executive secretary for the past six months. Belsley is a graduate of Pomona, Cal., College and the Robert Brookings Graduate School of Economics and Government.

# ROEBLING *Wires* ROUND... FLAT... SHAPED



**THIS STEEL "RIBBON"**  
**Outpulls a sashweight**  
**and saves Metal too!**



**ROUND HIGH AND LOW  
CARBON COMMON  
AND SPECIALTY WIRES**

Hard Drawn, Soft Annealed or Tempered, in all Finishes—Bright, liquor Finish, Coppered, Tinned, Galvanized.



**FLAT HIGH AND LOW  
CARBON AND  
SPECIALTY WIRES**

Hard Rolled, Annealed, Scaleless Tempered; Tempered and Polished, Tempered, Polished and Colored; Various Finishes—Bright, Tinned, Coppered, Hot or Electro Galvanized.

### SHAPED WIRES

Various High or Low Carbon Shaped Wires such as: Shaft Casing Wires, I Beam Sections, Space Block Wires, Square, Keystone, Oval, Half Oval, Half Round, etc.

The old-time sashweight requiring 26-lbs. of iron per window is on its way out! And its place is taken by a balance weighing less than 1½-lbs. ... a vital saving of metal needed for defense.

An important part of this new balance is the wire that counterbalances the window... wire that calls for exceptional steel making: Toughness to withstand flexing every time the window goes up or down. Temper held within close limits—to correctly balance the weight of the sash. Uniform quality that adds to the reputation of a pioneering product.

Making steel wire for tough jobs like this is a specialty. If your problem calls for round, flat or shaped wire to exacting specifications, Roebling is organized and trained to meet them!



**JOHN A. ROEBLING'S SONS COMPANY**

TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities



**Production Records****Broken In March**

••• As the war progresses, steel and iron production records are being broken frequently. No less than three steel producers during March broke all-time plant production records, and new departmental records showed up throughout the industry. The previous records at Republic Steel Corp., established in October, 1941, fell by the wayside. Highs in both

pig iron and steel ingot output were topped, and a new mark was set in electric furnace steel output. Departmental records were broken in every one of Republic's steel-producing districts, and an accepted world's record for pig iron production from a single blast furnace was beaten. Production of urgently needed ship plates and bars was also increased.

At Great Lakes Steel Corp.'s Zug Island blast furnace, all daily and monthly recognized world records were broken with a straight

ore burden production for the month of 43,478 tons and the high daily production of 1608 tons. The previously widely acclaimed world record of 41,782 tons for one month was set in Pittsburgh just a few weeks ago. The record was set with a consumption of less than 1700 lb. of coke per ton of iron, representing a decrease of about 5 per cent in coke consumption, and conservation of this vital war material.

Likewise, another subsidiary of National Steel Corp., the Weirton Steel Co., broke its share of records by producing 153,823 tons of steel during March. This exceeds the previous record set in October, 1939, by more than 13,000 tons and was established with the use of 12 stationary open hearths. New finishing mill production records were also established during March.

The greatest production for one month in the 31 years that the Middletown Division of American Rolling Mill Co., has operated, was recorded by the blast furnace, open hearth, blooming, bar, and strip mill departments. It was pointed out that the record is more impressive in view of the hand-to-mouth supply of steel scrap that has been available to the mill.

**Alcoa "Slowdowners" Fired**

*Cleveland*

••• "Slowdowns" and other labor difficulties that have periodically plagued the Aluminum Co. of America's plant here appeared to have been halted for the present, when investigation by a War Labor Board representative resulted in the firing of four union shop stewards, who were blamed for instigating the latest slowdown. Alex Balint, an alien, and regional director of the CIO Mine, Mill & Smelter Workers' Union, charged that his union had been trying to get the Alcoa plant to operate its forges 24 hr. a day, 7 days a week, instead of for only two shifts 5 days a week. However, the company stated that the Government is "thoroughly acquainted with our production situation." Meanwhile, union representatives, who are considering the expelling of the 4 stewards from membership in the union, are pressing demands for a \$1 a day wage increase for the men, and for a union shop.

*Ask*

# MEAKER!

**Equipment for**  
**GALVANIZING**  
 (Electro Process)  
**PICKLING**  
**CLEANING**  
**PLATING**

At your Service . . . the country's  
 leading practical plating engineers.

ADDRESS:  
**The MEAKER co.**  
 1635 So. 55th Ave., Chicago

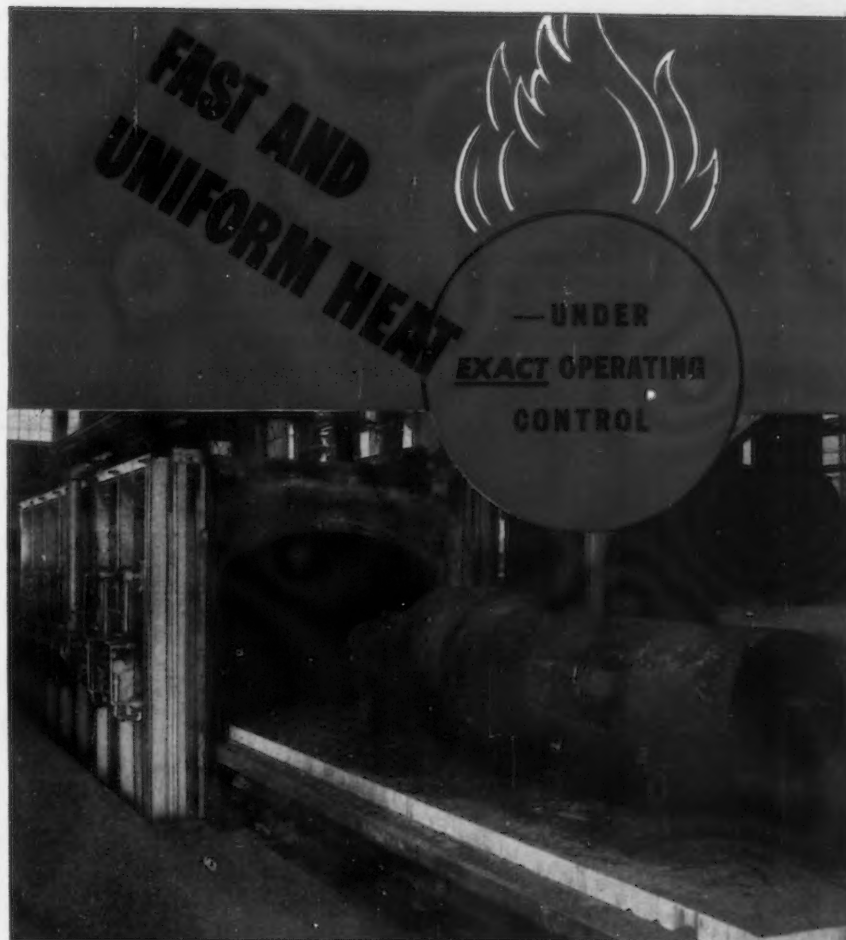
## Welding Society Decides To Hold Annual Meeting

•••The American Welding Society will hold its 23rd annual meeting this year as usual, it was announced by the society's Executive Committee. In making the announcement, officials of the society expressed their belief that the best interests of the war effort would be served by intensifying their educational engineering program.

This year's annual meeting of the society, which is now definitely scheduled, will be held in Detroit Oct. 12 to 16. Arrangements have already been made for hotel accommodations and the program committee is scheduling the preparation of technical papers on the subjects of most timely interest in connection with uses of welding to aid war production. It is expected that some 60 papers will be presented this year.



**ROCK DRILL TEETH MILLER:** Milling the teeth on rock drill cones made by Hughes Tool Co., Houston. This work is done with a special end milling fixture in a standard Gould & Eberhardt gear cutter. These drills are later carburized and additional resistance to abrasion is obtained by the application of fused tungsten carbide to the teeth.



*Delivered day in  
and day out by*

# SWINDELL

## HIGH TEMPERATURE CAR-TYPE FURNACES

—on scores of war production assignments where performance *must* be right!

LET US  
CONSULT  
ON YOUR  
PRESENT  
FURNACE  
PROBLEMS

**SWINDELL-DRESSLER Corporation**  
DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES  
PITTSBURGH, PA.



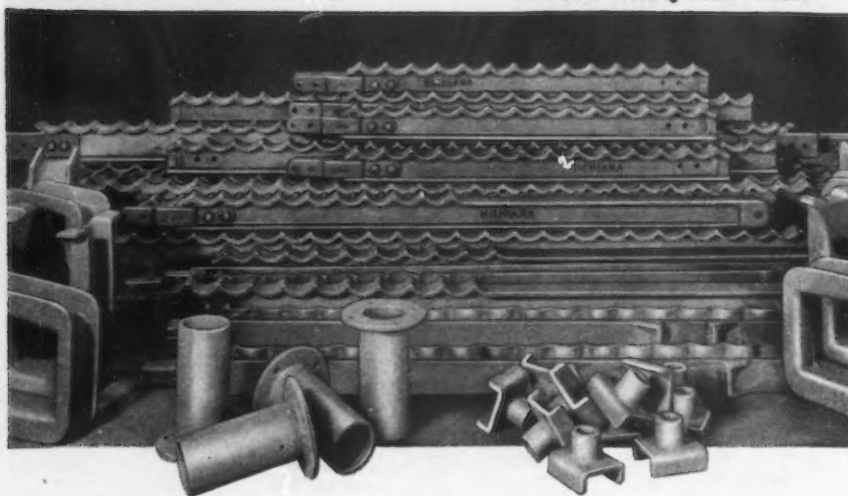
## "Reclaiming Program" for Engineers Inaugurated

Buffalo

• • • Curtiss-Wright Corp., airplane division, has announced a plan to "reclaim" engineers who have drifted into other fields. Electrical, mechanical and civil engineers who have not practised their profession for years will be

put through a four to six-week "refresher course" given by Curtiss in cooperation with the extension school of Cornell University. The men will be on the Curtiss payroll during this period after which they will be assigned to jobs in the company's plants in Columbus, St. Louis or Buffalo. At present there is no indication how many men the company will be able to "reclaim."

MICHIANA Heat-Resistant Alloy  
Parts for Walking Beam Furnace



## UNIFORM QUALITY AND ACCURACY MEAN STEADY TOP PRODUCTION

Particularly where many heat-resistant alloy castings are parts of complete assemblies, are uniformity of quality and accuracy of each part important to insure maximum performance.

At MICHIANA, nearly a quarter of a century of alloy casting specialization is coupled with traditional care in consideration of the specific requirements and in production in the foundry. From the laboratory to final inspection, care has become a confirmed habit.

MICHIANA can meet practically all of your needs—in size, alloy characteristics, or other factors... MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana.

**MICHIANA**  
Heat-Resistant and  
Stainless Steel  
ALLOY CASTINGS

- Muffles      • Retorts      • Sprockets      • Chains
- Boxes      • Pots      • Heat-Resistant and
- Rails      • Grids      Stainless Steel Cast-
- Rolls      • Tubes      ings of all kinds.

## National Tool Expects to Exceed 1941 Output by 40%

Cleveland

• • • Although its 1940 rate of shipments was doubled in 1941, the National Tool Co. expects to increase its output 40 per cent by June 1, when its present expansion program, including the construction of new plant space to house \$500,000 worth of new equipment, is completed. According to Samuel J. Kornhauser, chairman and general counsel for the firm, the company's increase in output will depend upon the supply of tool steel. This situation is now being studied by the Government.

## Trade Notes

Cleaver-Brooks Co., Milwaukee, manufacturer of boilers and water distilling apparatus, has purchased the factory and site of the former Andres Stone & Marble Co., 326 E. Keefe Avenue, Milwaukee.

Wausau Engineering Co., Wausau, Wis., has been organized by Ralph C. Kaser, Cleveland foundry industrialist. Charles Mertes of Mertes Mfg. Co., Wausau, will be associated with him. Supervisory and technical employees will be brought to Wausau from Cleveland.

Interest in the Iroquois Foundry Co., Racine, Wis., has been sold by Robert L. Niess to John C. Juras and August C. Vierthaler.

Vultee Aircraft's Manufacturing Research Division has moved its offices, laboratories and shops from Wayne, Mich., and 218 Boulevard Building, Detroit, to 7 Avalon Street, Detroit.

The H. H. Crow Equipment Co., 216 East Fourth Street, Little Rock, Ark., has been appointed authorized distributor for the hoist, body and tank divisions of Gar Wood Industries, Inc., Detroit. The new distributor will also handle the Gar Wood line of winches and cranes.

The Acoustic Division of Burgess Battery Co. has moved to 2815 West Roscoe Street, Chicago.

Lincoln Electric Co. has announced new addresses for its Oklahoma City, Milwaukee, Chattanooga, Chicago, Omaha and Dayton, Ohio, offices. The Oklahoma City address is now 19 North Ellison Street. R. L. Looney, manager, will be in charge and will be assisted by O. L. Rogers and C. M. Bowen. The new location of the Milwaukee office is at 733 North Van Buren Street. F. C. Archer continues as district manager. R. M. Daniels is in charge of the Chattanooga office now located at 1111 James Building. The Chicago office is now located at 323-325 East 23rd Street and G. E. Tenney continues as manager. Fuchs Machinery & Supply Co., the Lincoln office in Omaha, has been moved to 521 South 15th Street. The new address of the Dayton office is 246 Wiltshire Boulevard and R. P. Sharer, manager, is in charge.

Oliver Brothers, Inc., has moved its Chicago office from the Socony-Vacuum Building, 59 East Van Buren Street, to the Utilities Building, 327 South La Salle Street.

## Ingenuity of Small Plants Lands Work On War Production

By DON JAMES  
(Associate Editor)

••• Numerous small plants in the vicinity of New York, waging a vigorous fight for their right to exist, have succeeded in converting to war production recently. Several cases involve transpositions by stampers, who as a class have been considered farther behind the eight-ball than any other industrial group.

Instances where small plants have been handed war work out of a clear sky are becoming rarer. The fact is that landing suitable jobs involves utmost determination and aggression. Experts have stated that the majority of 8000 firms registered with Army Ordnance in the New York area have little prospect of obtaining orders, because of unfamiliarity with the work, unsuitable machinery or other reasons.

Among the changeovers are: from radio chassis to airplane parts; drapery fixtures to incendiary bomb firing pins; license plate holders to field sterilizers; silverware to reflectors and small Navy instruments; metal games to bullet dies; galley equipment to ammunition boxes; merry-go-rounds to gun mounts; gold teeth to gold braid; steam tables to ammunition boxes; photographic flash bulb synchronizers to parts for fire control devices; hand bag ornaments to cartridge clips; oil burners to machine gun parts; and tackle boxes to ammunition boxes.

An interesting switch has been made in a Hoboken plant which formerly machined plastic boxes to house its toiletries. Women who formerly decorated the boxes by hand carving are now engaged in making hand-cut rotary files.

Denied plastics last October, the plant began to convert over in December when its stock of plastics had been exhausted. Production on the rotary files has just begun. The burr blanks are being cut from the bar on the same machines that cut plastic box parts. New forms were ground in the stellite cutting tools, however. The firm is the Shulton Co. G. L. Schultz is general manager.

Lacking screw machine capacity, a small stamping plant

made an arrangement with a small firm having two screw machines, which enabled both to supply small quantities of parts. Neither would have been able to undertake the work individually.

Other conversions involve the making of fuse parts by a lipstick container firm; the making of mortars by a farm equipment plant, and the production of aerial bomb fins by a metal sign company. Suggested conversions include the following:

**FOR COOKING UTENSIL PLANTS**—Hurricane lamps; bomb components; tail fin assemblies; magazine holders; engine cowlings.

**FOR METAL FURNITURE PLANTS**—Airplane fins; rudders; bomb parts; ammunition boxes.

**FOR REFRIGERATOR AND SIMILAR PLANTS**—Fuel tanks; general sheet metal work; engine cowlings; small compressors; fuse cylinders; mine sinkers; magneto parts; bomb components; searchlights; motor parts; smoke shells.

**FOR BOLT MAKERS**—Machine gun ammunition.

**FOR SEWING MACHINE FIRMS**—Rifle and pistol parts.

**FOR MAKERS OF FOUNTAIN PENS**—Primers, igniters; fuse components.

**LIGHT FIXTURES**—Cartridge cases; fuse and primer components.

**FOR STOVE MAKERS**—Wing and rear



**Power to spare!**

Pioneered... and Perfected...  
by Mercury

### In this unit constructed drive axle assembly

Here's the drive that's really tough! Motor and Drive are a single unit assembly, fully inclosed... reduces strain, simplifies construction • Double Reduction Spiral Bevel and Spur Gears transmit the maximum power with minimum wear. Semi-elliptic Spring Suspension provides smooth riding, reduces shock •

Brakes are in the wheels for greatest safety • Standardization of Parts and Easy Accessibility reduce maintenance time to the minimum.

For the complete story on the Mercury Drive Assembly and Mercury Material Handling Equipment write for Bulletin 201-5.

Mercury Pioneered and Perfected These Lift Truck Improvements:

The Hydraulic Lift  
Snap Action Cam Operated  
Controller  
Single Unit Double Reduction  
Drive Axle Assembly  
All Welded Frame  
Special Trail Axle Design

**MERCURY**

MANUFACTURING COMPANY 4144 S. Halsted St., Chicago, Ill.

TRACTORS • TRAILERS • LIFT TRUCKS





fuselage assemblies; small parts; bomb assemblies; cylinder and fuse containers.

A hardware firm in the Bronx has succeeded in converting its equipment to the making of bomb parts. A Long Island maker of hooks, snap fasteners and zippers is now making bomb fuses.

Not so fortunate to date is a large New Jersey company making costume jewelry. Although it is exceptionally busy on its peacetime line, the owners want war work for patriotic reasons and are

willing to take jobs at a loss just to get into the swim. The company has bid on several jobs like primers and uniform insignia, but even though low has been rejected due to lack of experience. The company has plenty of capital, a crew of 25 toolmakers and a brand new plant with much press equipment.

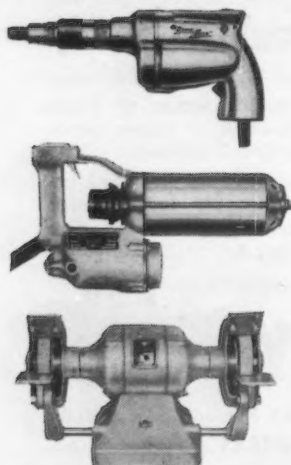
One of the outstanding examples of enterprise in the East has been provided by a firm which formerly

### 600 Stone Planers Reported Available

At least 600 stone planers, most of them in good condition, are available in areas east of the Rockies, according to "WPB Contract News," weekly bulletin issued by the New York Contract Distribution Branch of WPB. Experience in converted stone shops in Vermont and Indiana indicates that stone workers can successfully convert the planers to the rough planing of castings. Nineteen of the planers are located at Proctor, Vt.; 25 at Cleveland, Ohio; 10 at Indianapolis, and 13 at Knoxville, Tenn.

## "WORK SIMPLIFICATION" and SPEED-UP begin here

For the vastly increased production now called for under the Victory program, industry is looking to "work simplification" and speed-up . . . largely a process of adding the *right* electric tools in the *right* places, through careful job analysis. In the foreground of such planning in thousands of plants are Millers Falls portable electric tools, built for trouble-free service on dozens of repetitive operations. Millers Falls drills, nut runners, screw drivers, grinders, sanders, and hammers — well-spotted, applied according to plan — are saving precious time, cutting production cost. *Work-simplification-and-speed-up* — long a Millers Falls selling slant, now our customers' buying slant — is paying the country dividends.



For easy one-hand control, try powerful "Dyno-Mite" Screw Driver and Nut Runner; "Adjustomatic" clutch, pre-set to any tension, provides automatic disengagement. N. L. Speeds — 800 to 2500 R.P.M. Weight — 3½ lbs. All standard voltages. Accessories, fixtures available. *No waiting in line* when enough bench grinders are spotted through a shop. No. 810 is one of several top Millers Falls models. Rated 1 h.p., takes heavy overloads without stalling. Lighted eyeshields, stand, accessories available. *Only one moving part* keeps Millers Falls electric hammers in constant good condition, ready for high-speed repair or maintenance service. Delivers 3600 powerful blows per minute.

## MILLERS FALLS COMPANY

Manufacturers of Fine Hand Tools, Precision Tools,  
Portable Electric Tools, and Hack Saws

GREENFIELD, MASSACHUSETTS

made handbag frames, a stamping job. This company designed a small charging mechanism for guns which turned out to be an improvement over the existing mechanism. Within a remarkably short time the firm was into production, its whole production effort thrown into a new channel.

Much work has been spread in the New York area through the WPB Contract Distribution Office, located in the Chanin Building, on E. 42nd Street.

From steam tables to ammunition boxes is the story of a Long Island firm which turned all its sales force into an intensive drive to contact shipyards. Today the company is making 35 different items of equipment for over 70 shipbuilding firms, including powder containers, lockers, signal flag boards and items for ship's galley equipment. The purchase of welding equipment, a 10-ft. power press, power shears and other machinery was necessitated.

A manufacturer of corrugated paper machinery has secured much machine tool work in the past 10 months after adding three milling machines, diesel engines, a Magniflux outfit and several other pieces of equipment. The plant is rough and finish planing on bearing surfaces of turret gun housings; drilling and finishing airplane wing hinges; milling and finishing aluminum stub wing blocks, face milling and finishing steel castings and doing a variety of other jobs.

An auto parts maker in New York, formerly making license plate holders, direction signals and other small accessories, found itself in a difficult position when

*Now* IT CAN BE DONE!

**HYPER-MILLING**  
(NEGATIVE ANGLES)

A new method of  
milling hard steel  
at astonishing  
speeds

**FIRTHITE**

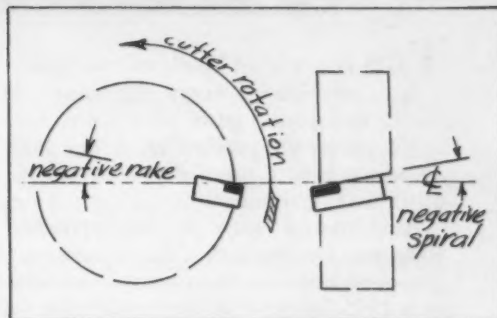
SAE 3145  
HEAT-TREATED  
ALLOY STEEL

**FIRTHITE Negative Rake** Face Mills speed the milling of parts for all calibers and types of both naval and artillery cannon.

Hyper-speed **FIRTHITE** Mills multiply armament production of all high-strength alloy-steel equipment vital to our War Effort.

These cutters are operated up to **TEN** times the speed and **SIX** times the feed of high-speed steel mills.

Complete face mills of this type are made by the **OK TOOL COMPANY, INC.**



Design of **FIRTHITE**-tipped face mill for steel. Note: Both **rake** and **spiral** angles are **NEGATIVE**!

**FIRTH-STERLING**  
**STEEL COMPANY**

OFFICES:  
**McKEESPORT, PA.**  
NEW YORK CHICAGO  
HARTFORD PHILADELPHIA  
LOS ANGELES DAYTON  
CLEVELAND DETROIT



clamps were placed on auto production and materials. Its facilities included only such forming, welding, polishing and plating equipment for small parts production.

The company undertook to produce several lots of field sterilizers for the Army on a subcontract basis. Later it entered its own bid on 10,000 additional sterilizers and landed a \$15,000 order. Sub-

sequently it got into the production of small parts for searchlight signal systems.

While small firms individually have been conducting a vigorous drive for war work, Congress has been moving slowly toward assisting them. Last week the Senate passed and sent to the House a measure intended to provide loans for small plants entering war production. The bill authorizes ap-

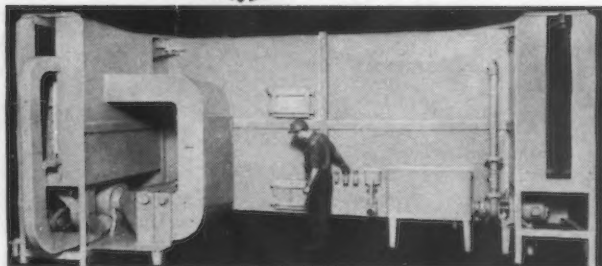


International News Photo

**WILSON-REUTHER DEBATE:** Walter Reuther, right, UAW official, submitted a plan for conversion of the auto industry to war work. Here he is shaking hands with C. E. Wilson, left, of General Motors, and George Denny, center, of New York's Town Hall. Wilson and Reuther debated the plan for several hours, and on one point at least, that management and labor should drop hostilities, they agreed.

## ★ NEW WEAPON FOR WAR !

Not in itself a weapon of war, this A-F machine to wash and dry the top, bottom, outside and bore of machine gun barrels faster than ever before will be a distinct aid in defeating the enemy.



**T**HIS is a war of steel; of machines; of industry!

It is the job of every American in industry to produce shells, cartridges, guns, planes and tanks quickly, perfectly!

To speed up production it has been found necessary to *speed-wash* and *speed-dry* many types of ammunition and other war equipment.

Anticipating such a development, we at the Alvey-Ferguson Co. started a big expansion program months ago. The first unit has been completed and has already resulted in a 25% increase in our production capacity.

Today, we can supply specialized machines with high pressure super-spray systems which operate efficiently at maximum speed!

All orders, whether for War Production or not, will be given the same courteous consideration that has created friends for us throughout America.

Write, wire or phone for a discussion or literature today.

The Alvey-Ferguson Co., 731 Disney St., Cincinnati, Ohio.



# ALVEY-FERGUSON

## Conveyors

### AND PRODUCT WASHING MACHINES

pointment of a special deputy for small business in the War Production Board and the establishment of a smaller war plants corporation with \$100,000,000 capital from the Treasury.

### Metallurgical Engineers' Group to Meet April 16, 17

Cincinnati

• • • Ways to increase production for the nation's war effort will be studied at the annual conference of the National Open Hearth and Blast Furnace and Raw Materials Committees of the Iron and Steel Division of the American Institute of Mining and Metallurgical Engineers here, April 16 and 17. More than 800 executives and operating men are expected to attend. The War Production Board will be represented.

Committee chairmen are: L. F. Reinartz, American Rolling Mill Co., Middletown, Ohio, open hearth committee; H. W. Johnson, Inland Steel Co., Indiana Harbor, Ind., blast furnace and raw materials committee; C. R. FonDersmith, American Rolling Mill Co., and Rudolph Tietig, Andrews Steel Co., Newport, Ky., committee on arrangements for the open hearth program; C. L. Wyman, Butler Brothers, Cleveland, O. E. Clark, American Rolling Mill Co., and H. E. McDonnell, Weirton Steel Co., Weirton, W. Va., blast furnace and raw materials committee.



# "HIGHBALL"

In railroad language the clear track signal means "keep 'em rolling". Speed is tremendously important today but the railroads never lose sight of the need for safety.

In steel making the rules are the same—our path is clear and speed is terribly urgent. But again there is the same need for safety—for close control over every stage in steel making so that the product will meet specifications and do the job it was intended to do.

All the resources of the 147-year old Standard Steel organization are today devoted to beating every production schedule.

STEEL FORGINGS & CASTINGS • WELDLESS RINGS • STEEL WHEELS



*Standard flies the Navy Bureau of Ordnance Flag and "E" Pennant in recognition of excellency and achievement in the production of Naval ordnance materiel.*

## STANDARD STEEL WORKS



DIVISION OF  
THE BALDWIN LOCOMOTIVE WORKS  
PHILADELPHIA



## Workers Will Require 425,000 Homes By End of War *Buffalo*

• • • Private industry must provide at least 200,000 homes for war workers within the next few months and probably another 225,000 before the end of the war, David B. Simpson, of Portland, Ore., president of the National Association of Real Estate Boards,

said during a visit here last week-end.

Simpson urged greater use of existing industrial plants in war production rather than new plants in new locations, declaring that this policy should "head off the evils of great population shifts, and put more work where workers and their housing, transportation, schools, and other facilities already are located."



Harris & Ewing Photo

**GOOD NEIGHBORS:** Nelson Rockefeller, coordinator of Inter-American Affairs, extends a hearty greeting to General Arturo Espinosa Mujica of Chile, who represents the Latin American republics at the first meeting of the Inter-American Defense Board in Washington. The board was set up in January.

**T**IMES HAVE CHANGED. 'Control of the Air' is as essential in a war time economy as it is in the militaristic sense. It can no longer be ignored in any plant, regardless of size.

Dust spells inefficiency and waste—and these conditions cannot be condoned today when every shackle that keeps production in check *must* be loosed.

When the time comes "to do something" about the dust condition in your plant be sure to investigate "Dustubes"—they have the high efficiency necessary to do your job better; and they are by far the simplest cloth type collector to install, operate, and maintain. Write for literature today.



# AMERICAN

FOUNDRY EQUIPMENT CO.

510 S. BYRNKIT ST.

MISHAWAKA, IND.

## March Plant Expansion in Chicago Reaches \$16,388,000 *Chicago*

• • • Industrial expansion in March here amounted to \$16,388,000 for 35 plants, compared to \$8,321,000 for the same month in 1941. Metal trades were responsible for most of this expansion. Among the plants reporting were Fansteel Metallurgical Corp., Youngstown Sheet & Tube Co., Pullman-Standard Car Mfg. Co., Carnegie-Illinois Steel Corp., Chicago Rivet & Machine Co., Gage Structural Steel Co., Chicago Gear Mfg. Co., Manufacturers' Screw Products, Hudson Screw Machine Products Co., Hannifin Mfg. Co., Link-Belt Co., Illinois Gear & Machine Corp., National Die Casting Co.

## U. S. Steel Corp. Organizing Labor-Management Groups

• • • B. F. Fairless, president of United States Steel Corp., announced April 1 that the steel manufacturing and fabricating subsidiaries of the corporation are establishing Labor - Management Production Drive Committees in accordance with the plan put forward by Donald M. Nelson, WPB chairman.



**HIT** THE GERMANS!



**MUSS** THE ITALIANS!



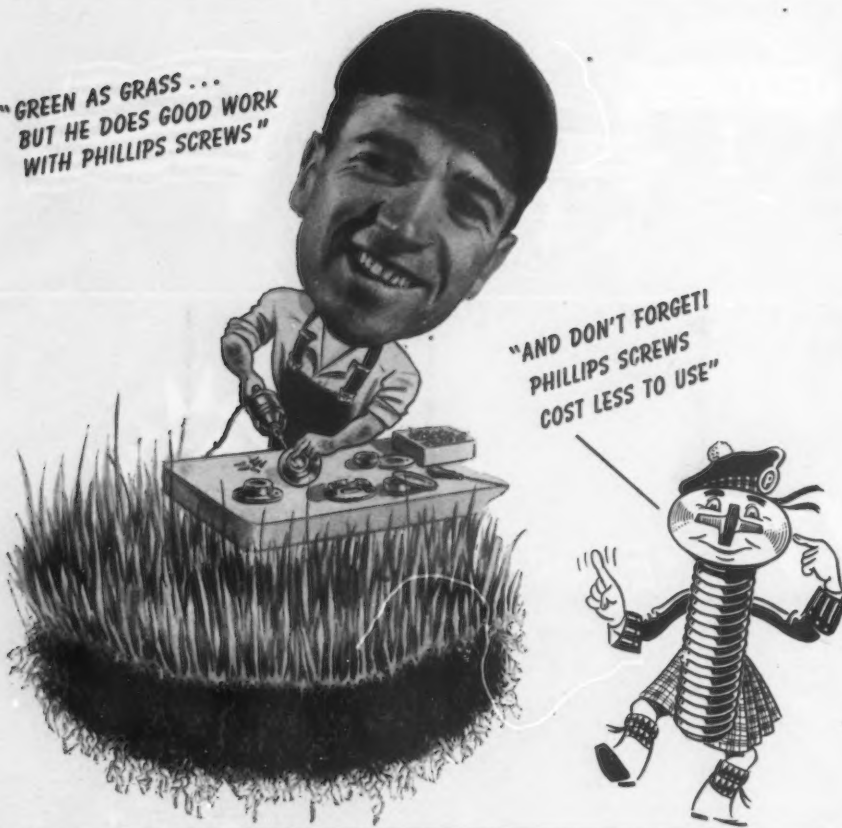
**NIP** THE NIPPONESE!



*Ohio Ferro-Alloys Corporation*  
*Canton, Ohio*



"GREEN AS GRASS...  
BUT HE DOES GOOD WORK  
WITH PHILLIPS SCREWS"



## Easy Driving • Elimination of Accidents • Better Work = 50% Less Assembly Cost with Phillips Screws

Assembly jobs that demand extra patience and plenty of time when using slotted screws, can now be handled... in a rush... by green men... who work with Phillips Screws.

Most important — there's no danger of screwdriver slippage. The driver can't slip from the Phillips recess... so faster driving methods are practical. Electric and pneumatic power drivers on many jobs where their use had previously been restricted.

Operations are simplified, too.

One-hand starting and driving. Perfect control even when the operator is in an awkward position. No chance for crooked screws, split screw heads or other time wasters.

Altogether, you can depend on *twice the assembly production* with Phillips Screws! Remember *that* for today's conditions when you're interested in saving time. Remember it for tomorrow's conditions when you may be *more* interested in saving cost!

Any of the firms listed below can supply further information.



**PHILLIPS RECESSED HEAD SCREWS**

**GIVE YOU 2 for 1** (SPEED AT LOWER COST)

WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS  
• SCREWS WITH LOCK WASHERS

U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079. 2,090,338. Other Domestic and Foreign Patents Allowed and Pending.

American Screw Co., Providence, R. I.  
The Bristol Co., Waterbury, Conn.  
Central Screw Co., Chicago, Ill.  
Chandler Products Corp., Cleveland, Ohio  
Continental Screw Co., New Bedford, Mass.  
The Corbin Screw Corp., New Britain, Conn.  
International Screw Co., Detroit, Mich.  
The Lamson & Sessions Co., Cleveland, Ohio  
The National Screw & Mfg. Co., Cleveland, Ohio

Whitney Screw Corp., Nashua, N.H.

New England Screw Co., Keene, N.H.  
The Charles Parker Co., Meriden, Conn.  
Parker-Kalon Corp., New York, N.Y.  
Pawtucket Screw Co., Pawtucket, R.I.  
Pheol Manufacturing Co., Chicago, Ill.  
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N.Y.  
Scovill Manufacturing Co., Waterbury, Conn.  
Shakeproof Inc., Chicago, Ill.  
The Southington Hardware Mfg. Co., Southington, Conn.

## Iron & Steel Engineers' Convention Sept. 22-24

Pittsburgh

• • • The Association of Iron & Steel Engineers will hold its 1942 annual convention in Pittsburgh Sept. 22, 23, and 24, but because of critical times has suspended the exposition usually held in conjunction with the convention.

According to Thomas E. Hughes, president, equipment and material going to make up the exhibits should not be delayed in taking its place in the production front.

The convention will be aimed towards engineering conferences with particular emphasis on the steel industry's problems in the current crisis.



## Spring Meeting in Ontario

• • • The Association of Iron & Steel Engineers will hold its spring conference in Hamilton, Ontario, on Monday and Tuesday, May 11 and 12.

## Strange Hospital Being Razed for Scrap

Cleveland

• • • A thousand tons of steel scrap are being salvaged here from a huge steel globe, containing 40 rooms and baths in which diabetic patients used to be treated under compressed air. The unique sanitarium, one of Cleveland's landmarks, was financed chiefly by the late H. H. Timken, president of Timken Roller Bearing Co., Canton, Ohio. It was erected 14 years ago, at a cost of \$1,000,000, but has been unused for several years. The salvage value of the 64 ft. diameter globe and three smaller globes surrounding it is about \$25,000. This includes an elaborate system of compressors, motors and generators.

## Suburb to Get Ordnance Office

Hammond, Ind.

• • • This Chicago suburb will probably soon have its own branch of the Chicago District Ordnance to supervise more than \$700,000,000 in war contracts held in the Calumet area.

## Machinery Caravan Tours Indiana for Subcontracts

Indianapolis

••• More than 600 vitally needed pieces of machinery are touring Indiana by caravans under the direction of WPB's local office of contract distribution. The caravan is similar to the subcontracting trains which toured the country last fall; but machinery parts, rather than actual war items, will be subcontracted in the Indiana project.

### COMING EVENTS

April 14 to 17—Packaging Exposition and Conference, Hotel Astor, New York.

April 15 to 17—Open Hearth Conference, Cincinnati.

April 15 to 18—The Electrochemical Society, spring convention, Nashville, Tenn.

April 18 to 24—Foundry and Allied Industries Show, Cleveland.

April 20 and 21—American Zinc Institute, 24th annual meeting, Chase Hotel, St. Louis.

April 20 to 23—American Chemical Society, Municipal Auditorium, Memphis, Tenn.

April 20 to 24—American Foundrymen's Association, Cleveland.

April 27 to May 1—American Mining Congress, Coal Show, Cincinnati.

May 4 to 6—Triple Mill Supply: Southern Supply & Machinery Distributors Association, National Supply & Machinery Distributors and American Supply & Machinery Manufacturers, Hotel Traymore, Atlantic City, N. J.

May 11 to 13—American Gear Manufacturers Association, 26th annual convention, Hershey, Pa.

May 19 and 20—National Metal Trades Association, 44th annual convention, Biltmore Hotel, New York.

May 25 to 28—National Association of Purchasing Agents Convention, Waldorf-Astoria Hotel, New York.

June 21 to 25—American Water Works Association, Chicago.

Aug. 23 to 30—National Association of Power Engineers, New Orleans.

Sept. 1 to 11—Building and Construction Trades Council, Atlantic City, N. J.

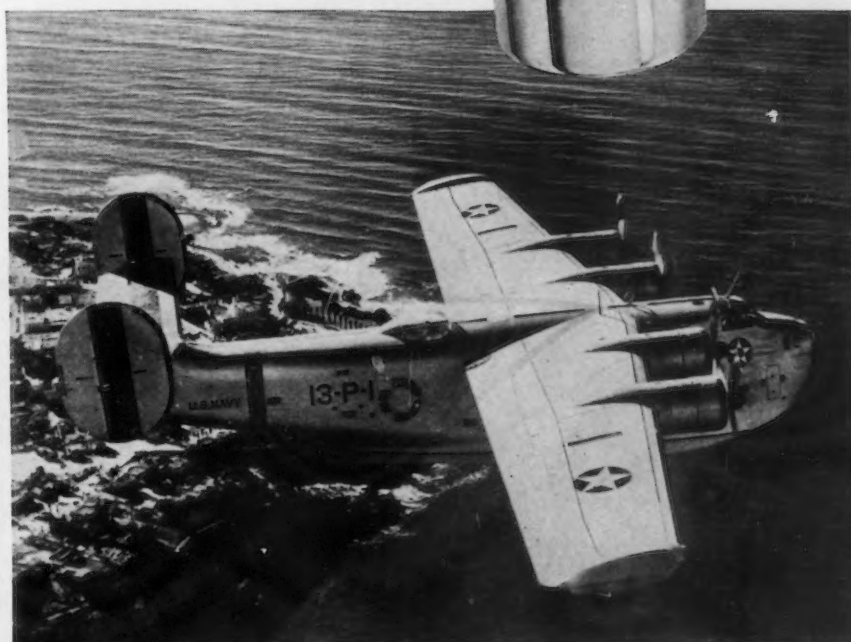
Sept. 22 to 24—Association of Iron & Steel Engineers convention, Pittsburgh. Iron and steel exhibit suspended this year.

Oct. 5 to 9—National Safety Congress Association, International convention, Baltimore.

Oct. 12 to 16—National Metal Congress and Exposition, Detroit.

Nov. 30 to Dec. 5—National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York.

## Kettles JOIN THE FIRE WALLS...



OFFICIAL U. S. NAVY PHOTOGRAPH

# 20,000 feet up

When Navy patrol bombers comb our vast coastal regions ARMCO Stainless Steels often have an important role in guarding the safety and comfort of the crews.

Its newest task on warplanes is an old story—to housewives. Now these versatile metals help feed hungry airmen. Pressure-cookers made of ARMCO Stainless Steel are standard equipment in many of our long-range flying boats.

ARMCO Stainless is doing its technical job well too. In fire walls and exhaust systems of our new war planes ARMCO Stainless defies temperatures up to 1650°F. In many other parts light though strong sheets of this hard, tough metal resist wear and corrosion and the vibration of roaring engines.

If you are making aircraft or vital parts and equipment for America's air forces, consider ARMCO Stainless Steels. They are supplied in the conventional types, including the columbium and titanium grades. Meanwhile write for a copy of the valuable book, "How to Fabricate ARMCO Stainless Steels." It gives complete data on the newest fabricating practices. The American Rolling Mill Co., 1401 Curtis Street, Middletown, Ohio.

### TO KEY MEN:

Can You Use Sheet Metal  
Working Data for War Products—and Post War Plans?





## NEWS OF IND



A black and white illustration of a man in a suit, seen from the side, looking down at a large globe. The globe shows a dark, textured surface, possibly representing the Earth or a celestial body. The man's expression is one of contemplation or concern.

A black cylindrical container, likely a canister, with a label that reads "SALT TABLETS for Heat Fag". The label is white with black text and a decorative border. The container has a black cap at the bottom.

**EVERYONE WHO SWEATS NEEDS SALT**

**FREE Sample Tube**  
Write—on your firm letterhead — for a pocket size sample tube of Morton's Salt Tablets and for the new folder — "Heat, Fog and Accidents Ride Together."



*Kansas City, Mo.*

Remarking that the scrap dealers were doing a big job, he urged his listeners to take their scrap to a dealer and trust him to grade it, sort and shear it for the steel mills.

## Washington

The letter referred specifically to the movement of scrap metals and rubber from rural areas, where collection facilities have been limited. Recently it was announced that labor and trucks would be provided by the Work Projects Administration in moving remote scrap materials.



**CRACK THE JAP:** Dayton Rubber Mfg. Co., inaugurated a plant wide campaign to "Save Time, Machinery, and Materials, and Crack the Jap!" Banners and show cards, as well as lapel tags and stickers, are making every employee feel the responsibility of America's all-out war effort.

### Arc Welding Training Films To Be Distributed by G. E.

•••The visual instruction section of General Electric has taken over Raphael G. Wolff's 16-mm. color-film series, "Inside of Arc Welding," for noncommercial distribution to schools and other instruction groups to speed up war production training.

First picture in the series titled, "Fundamentals," was recently completed at the Wolff studios in Hollywood. Five additional subjects, all in color, are now in final script. Subjects are "Flat Arc Welding," "Horizontal Arc Welding," "Flat and Horizontal A.C. Welding," "Vertical Arc Welding" and "Overhead Arc Welding."

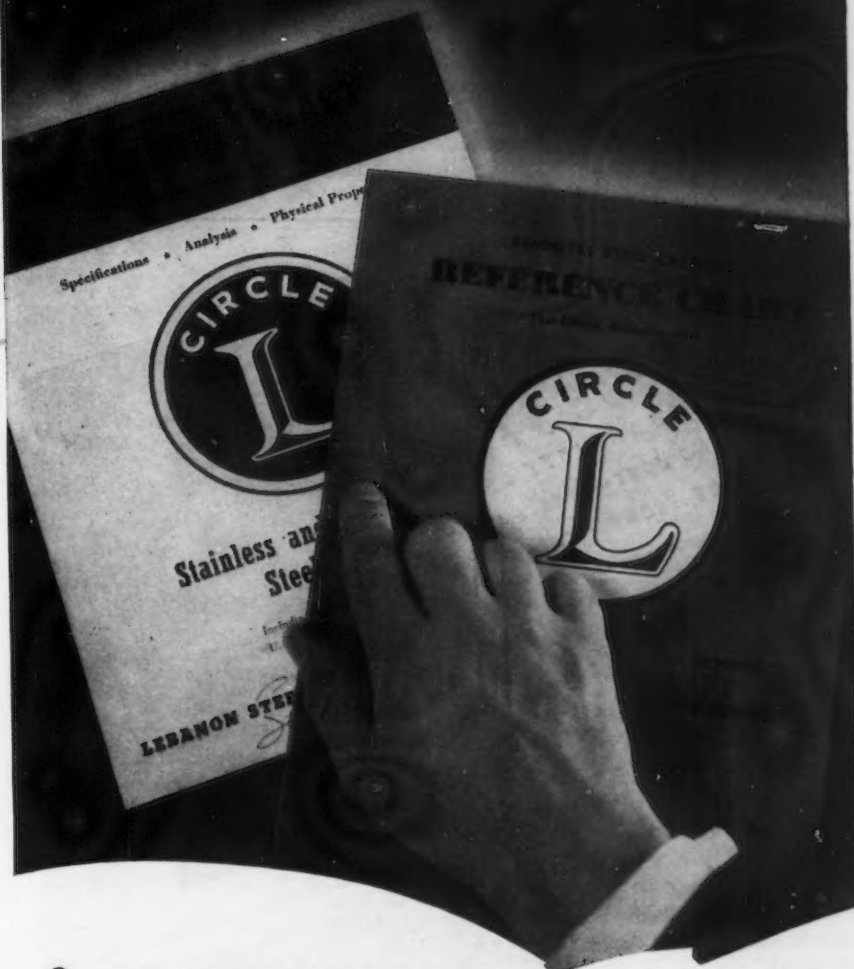
The series will show in detail each step of the welding process with charts and diagrams as well as actual photographic action. Wolff and his staff started shooting technical sequences for the remaining pictures during the week of March 23 at General Electric's Schenectady plant.

### Experimental Awards

Chicago

•••Several aluminum fabricators in this area have been given experimental contracts on the production of steel cartridge cases.

## Placing Knowledge at the Fingertips of Steel Casting Users



### 2 Handy Lebanon Reference Charts Provide Needed Information

**MORE** than ever before, industry now needs condensed, helpful information about steel castings. In the Lebanon program to provide such information, one important step has been the compiling of two "thumbnail encyclopedias." These references cover major technical data about Circle L Steel Castings . . . are designed for convenient use . . . and save time for steel casting users.

**CARBON AND LOW STRUCTURAL ALLOYS REFERENCE CHART (left)**—Concise data on Lebanon Carbon and Low Structural Alloys. Specifications, analyses and physical properties are given. Also included are comparable classifications of U.S. Government, S.A.E. and A.S.T.M.

**STAINLESS STEEL CASTINGS REFERENCE CHART (right)**—Covers Circle L Stainless, Corrosion Resistant and Heat Resistant Alloys . . . shows wrought and cast materials of comparable analyses. Designations, alloying elements, physical properties, heat treatment are covered.

Both charts are available to executives, engineers and metallurgists upon request.

**LEBANON STEEL FOUNDRY • LEBANON, PENNA.**

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD



**LEBANON** *Stainless and Special Alloy* **STEEL CASTINGS**



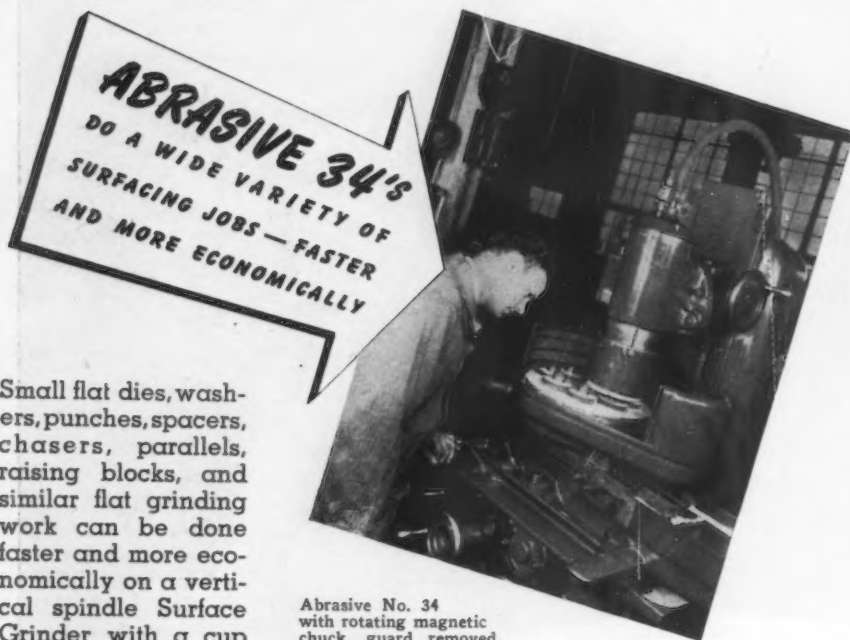
## WPB Seizes 10,000 Tons Of Scrap in Dayton

Washington

• • • For the second time recently, WPB's Bureau of Industrial Conservation has used its requisitioning powers to seize scrap metal for war production. Its latest catch consisted of about 10,000 tons of defective refrigerator cases and miscellaneous scrap

metal which for more than 10 years had lain in a ravine near Dayton, Ohio. The Metals Reserve Corp. will pay for the seized metal and will in turn sell it to a dealer.

The Frigidaire division of General Motors Corp. received permission about ten years ago from the three Eby brothers to dump the defective cases into the ravine. The abandoned cases then became



Small flat dies, washers, punches, spacers, chasers, parallels, raising blocks, and similar flat grinding work can be done faster and more economically on a vertical spindle Surface Grinder with a cup wheel — if the machine is designed for that work!

Abrasive No. 34 with rotating magnetic chuck, guard removed, showing work. Some work is better handled on the reciprocating table.

The Abrasive 34 is designed for that purpose, hence, it features:

1. Maximum power at the cutting point;
2. Rugged construction which reduces vibration;
3. Spindle drive through hardened and lapped spiral bevel gears.

The No. 34 is typical of the entire line of Abrasive Surface Grinders. Accuracy is built into them — and has been for over 25 years!



No. 3B Surface Grinder

### ABRASIVE

WRITE OR PHONE  
NEAREST DEALER

HENRY PRENTISS & CO.

New York Murray Hill 9-6492  
Boston Hancock 6750  
Worcester 3-2173  
Springfield 4-6393  
Hartford 32-4489  
Buffalo Delaware 3420  
Rochester Genesee 764  
Syracuse 2-2972

MACHINE TOOL CO., EAST PROVIDENCE, RHODE ISLAND, U. S. A.

SWIND MACHINERY CO.

Philadelphia Rittenhouse 4340  
Baltimore Tuxedo 0104  
York 5820

THE MOTT & MERRY-

WEATHER MACHINERY CO.

Cleveland Main 1000  
Pittsburgh Atlantic 3985  
Cincinnati Main 2666  
Alhron University 3075

CHENEY & MORETON

Detroit 2-5050

MARSHALL & HUSCHART

MACHINERY CO.

Chicago Randolph 8860

Milwaukee Edgewood 3576

Rock Island 348

South Bend 4-9355

MARSHALL & HUSCHART

MACHINERY CO. OF IND.

Indianapolis Riley 6235

Muncy 4837

BLACKMAN & HUETZEL

MACH. CO., INC.

St. Louis No. 0765

TIDEWATER SUPPLY

CO., INC.

Norfolk 27311

Ashville 376

Columbia 5169

W. S. MURIAN CO.

Knoxville 2-4331

HENES-MORGAN

MACHINERY CO. LTD.

Los Angeles Jefferson 7185

JENISON MACHINERY CO.

San Francisco Valencia 1710



International News Photo

**SEIZED SCRAP:** This 10,000-ton mountain of scrap from discarded refrigerator cabinets and other metal parts was seized after the owners refused to sell to dealers. The owners were paid \$4.00 a ton for the metal which covered an acre of ground near Dayton, Ohio.

the property of the Ebys, who, it was claimed, recently refused to sell them for scrap at \$4 per net ton.



## Buffalo Scrap May Be Seized

Buffalo

• • • Scrap metal and unused fabricated materials lying idle in Buffalo plants will be requisitioned unless they are moved quickly into war production, Joseph M. Burke, WPB representative, told the Buffalo Defense Council's salvage committee this week.

Burke said he found 150 tons of cast iron in a local plant last week, and 100 tons of rubber, in a Binghamton, N. Y., plant, which may be shipped here to keep the United States Rubber Reclaiming Co. plant operating.

## WPB Names Sub-Committee to Plumbing and Heating Group

Washington

••• The WPB Bureau of Industry Advisory Committees has announced the formation of the Sanitary Cast Iron and Formed Enamelware Sub-committee of the Plumbing and Heating Advisory Committee.

Walter W. Timmis, chief of the Plumbing and Heating Branch, is government presiding officer.

Committee members are:

M. L. Ondo, director of Washington office, Youngstown Pressed Steel Division, Mullins Co., Washington; C. A. Ferguson, president, Maryland Sanitary Mfg. Co., Baltimore; W. G. Moore, president, Humphreys Mfg. Co., Mansfield, Ohio; E. O. Brady, assistant sales manager, Briggs Mfg. Co., Detroit; J. M. Carbeau, Ellwood Co., Ellwood City, Pa.; C. C. Adams, vice-president, Richmond Radiator, Uniontown, Pa.; T. M. Hodges, vice-president, U. S. Sanitary Mfg. Co., Pittsburgh; E. P. Uphues, assistant manager, Crane Co., Chicago; Thomas J. Hannah, Jr., American Radiator & Standard Sanitary Corp., Pittsburgh; C. A. Morrow, Mullins Mfg. Co., Warren, Ohio; R. R. Crane, vice-president, Eljer Co., Ford City, Pa.; S. L. Stoup, Auburn Central Mfg. Corp., Connersville, Ind.; A. G. Zibbell, Kohler Co., Kohler, Wis.; H. C. Beresford, department manager, Murray Corp. of America, Detroit; H. J. Held, vice-president, Runlle Mfg. Co., Milwaukee; Louis Probst, vice-president, National Sanitary Co., Salem, Ohio; James M. Bonner, secretary, Washington-Eljer Co., Los Angeles, and R. R. Trubey, president, Davidson Enamel Co., Clyde, Ohio.

## CIO Foundry Union Tells Men To Work Pending Settlement

Milwaukee

••• Officials of the CIO cracked down on members of the union working at the North End Foundry Co., who had refused to continue overtime work as a protest against failure of the management to meet contract demands. Improved equipment and a 15c. hourly wage increase were the questions involved. The men were ordered back to work on their former basis until proper negotiations were concluded.

## Furniture Plants Converting For Wooden Airplane Parts

Rockford, Ill.

••• Furniture manufacturers, who comprise one of this city's two principal industries, are working on conversion to production of wooden airplane parts. There are reports that a plant will be erected in the midwest to build military transport planes out of plywood and other non-vital materials. Such planes would be used for transporting personnel, equipment and supplies to combat areas.

## Chain Link Fence Output To Stop April 30 in Canada

Ottawa, Canada

••• By agreement with manufacturers, the production of all chain link fencing will be stopped on April 30 and no sales will be made by the fabricators after May 31, it was announced by the Department of Munitions and Sup-

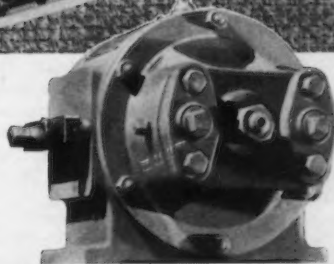
ply. Retailers will be permitted to dispose of their existing stocks. Restrictions are also being placed on manufacturing of the fencing before April 30. After that date the only steel fencing which may be made will be a very light weave for use on farms. "Steel is so badly needed for war purposes that it may be necessary to curtail even this lighter fencing at some future date," said Mr. Kilbourn.

## PRACTICE THRIFT with a PURPOSE

Buy U. S. Defense Bonds and Stamps . . . Hele-Shaw Fluid Power is thrifty, too!



We've told you many times that Hele-Shaw Fluid Power is oil under pressure from a Hele-Shaw Pump. We've told you that it is used in many types of hydraulically operated machines. We believe we've mentioned the fact that the pressure of a Hele-Shaw Pump can be regulated by certain Hele-Shaw controls, that the volume of discharge can be varied from zero to maximum, and that the direction of flow can be changed, if necessary, in almost an instant. In spite of all these and many more advantages, the Hele-Shaw Pump—believe it or not—is run by a low cost, constant speed motor. All variations in pressure, discharge and direction of flow are made at the pump without changing rotation of the motor. And the pump only uses energy when it is "on stroke". Design for thrift with Hele-Shaw Fluid Power. Write today for our Hele-Shaw Pump catalog.



THE  
**Hele-Shaw**  
Fluid Power Pump

OTHER A-E-CO PRODUCTS: TAYLOR STOKERS, MARINE DECK AUXILIARIES, LO-HED HOISTS

**AMERICAN ENGINEERING COMPANY**  
2410 ARAMINGO AVENUE, PHILADELPHIA, PA.



## Machine Tool Output for '42 Placed at \$1,600,000,000

Cleveland

• • • Machine tool shipments for 1942, according to Tell Berna, general manager of the National Machine Tool Builders Association, will probably be eight to ten times the normal output of the industry. To this may be added old machines, rebuilt and put to work.

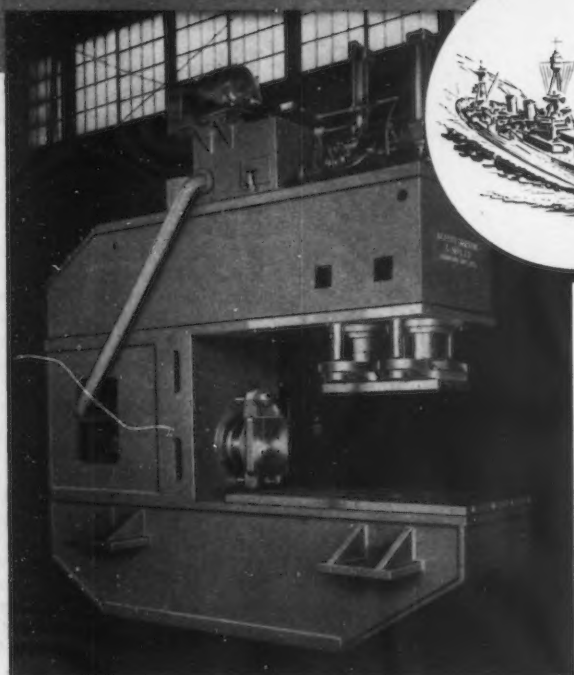
However, in a speech made before the Cleveland Engineering Society March 10, Mr. Berna pointed out that it will be difficult, indeed, for American war industries to absorb this enormous quantity of machine tools. The speed with which metallurgists, toolmakers, foremen and other highly skilled workers required in the application of machine tools can be trained will be an important influence and limiting



International News Photo

**NEW ORDNANCE CHIEF:** Major General James H. Burns has been named Chief of Army Ordnance, succeeding Major General C. N. Wesson whose term expires June 2.

## WHAT PUTS THE BATTLE IN A BATTLESHIP?



### BEATTY 400-TON FLANGING AND FORMING PRESS



250-Ton Capacity  
Hydraulic Press

IT'S ARMOR PLATE that keeps a battleship afloat. The thicker the plate, the stronger the ship . . . and the more powerful the PRESS required to fabricate that armored hull! Beatty-Engineered Hydraulic Presses (up to 750-ton capacities) are being used extensively in the shipbuilding, tank, railroad car, and other vital war industries. But this is just one of Beatty's heavy metal working machines. If your production calls for punching, shearing, coping, pressing, forming, flanging or the like, call in a Beatty engineer to help you select the right machine for the job. Write for complete information.

# BEATTY

MACHINE & MFG. COMPANY  
HAMMOND, INDIANA

factor upon our 1942 war output. For these reasons, Mr. Berna believes that the amount of machine tools that will be completed this year may be able to meet actual requirements.

In comparing the relative production strength of the leading nations at war, Mr. Berna estimated that German machine tool output is probably in the vicinity of only \$175,000,000 worth of equipment annually. Since our production is many times that of the Axis power, the United States enjoys the fundamental advantage of being able to outstrip all of the axis nations put together in the setting up of new equipment for the manufacture of war essentials. Mr. Berna reported that German machine tool plants were having difficulty in operations due to the lack of sufficient maintenance men and the average low skill of the worker now being used in German plants.



AP Photo

**SYNTHETIC RUBBER:** William S. Farish, president of Standard Oil Co. of New Jersey, declared that synthetic butyl rubber samples developed by the company were submitted to the U. S. Government and private American concerns in 1939, but were claimed to be of doubtful quality.

At the same time, on the basis of various reports coming to him from visitors who had been to Japan in recent years, Mr. Berna believes that the Japanese have managed to accumulate their present war equipment over a long number of years, but it is unlikely that their production capacity will enable them to replace their losses in war at any reasonable rate.

Despite the relatively overwhelming superiority of American productive capacity, Mr. Berna warned against over-confidence and pointed out that there are still many difficulties and obstacles for the nation to overcome. He mentioned that the wider employment of women is severely limited by existing laws in many states. Yet Mr. Berna expects that more and more women will have to be used in American machine tool plants to replace the men entering our armed services and to meet the requirements of expanding machine tool plants for additional personnel.

### WPB Names Planning Director Washington

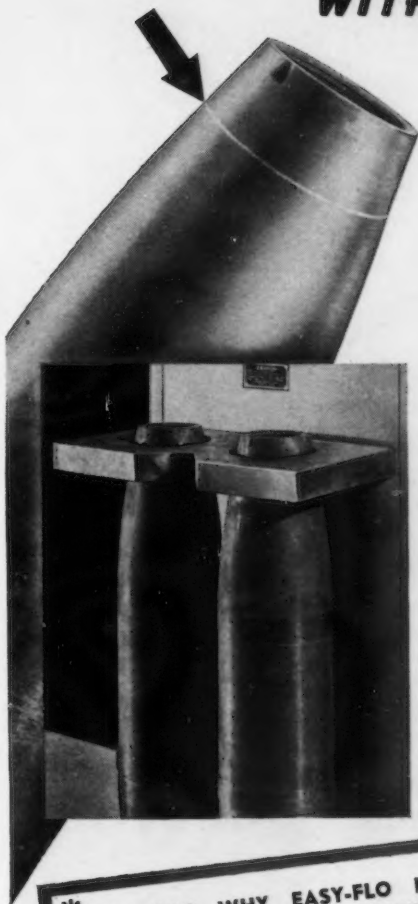
••• Edward T. Dickinson, Jr., formerly research assistant to Irving S. Olds, chairman of the United States Steel Corp., specializing in national defense problems, has been appointed executive director of WPB's Planning Committee. Before working for U. S. Steel, he was trust auditor

for the Brooklyn Trust Co. and special agent of the Fidelity & Casualty Co., New York.

### Correction

••• The article, "Home Made Photo Identification System," published in the March 19 issue was designed by the Columbian Steel Tank Co., at Kansas City instead of St. Louis.

## FAST PRODUCTION OF LEAK-TIGHT JOINTS WITH EASY-FLO



Here's another case where *strong, sound joints\** brazed with EASY-FLO plus a procedure designed to facilitate handling and heating have speeded up production.

### THE JOB—

Making leak-tight joints between steel adapters and steel bodies of 75, 81, 105 and 155 mm. shells.

### PROCEDURE—

After fluxing, a ring of EASY-FLO is preplaced in a groove in the adapters which are then assembled in the bodies. Next the assemblies are placed as shown in the work coils of an induction heating unit. A switch is thrown and in a matter of seconds the joints are made. The result is a steady stream of brazed shells.

### WE'RE READY TO HELP YOU SPEED UP YOUR BRAZING

If you can use increased production, or better joints, on any ferrous, non-ferrous or dissimilar metal joining job, we're ready to send a Field Engineer to show what EASY-FLO can do and to help you work out the most effective procedure for the job.



FOR FULL DETAILS  
ABOUT EASY-FLO  
Write for BULLETIN No. 12

### \* REASONS WHY EASY-FLO MAKES LEAK-TIGHT JOINTS IN QUICK TIME

Exceptionally free-flowing, EASY-FLO penetrates instantly to all parts of a joint and into the joined metal surfaces, actually alloying with them. Add to this fast penetration, the low flow point of EASY-FLO — 1175° F. — and you have the answer to EASY-FLO brazing SPEED plus RELIABILITY. Complete details in Bulletin No. 12.



**HANDY & HARMAN**

82 FULTON ST., NEW YORK

Agents in Principal Cities. In Canada: HANDY & HARMAN of Canada, Ltd., Toronto



## 90 Million Ton Lake Ore Shipment in 1942 Foreseen

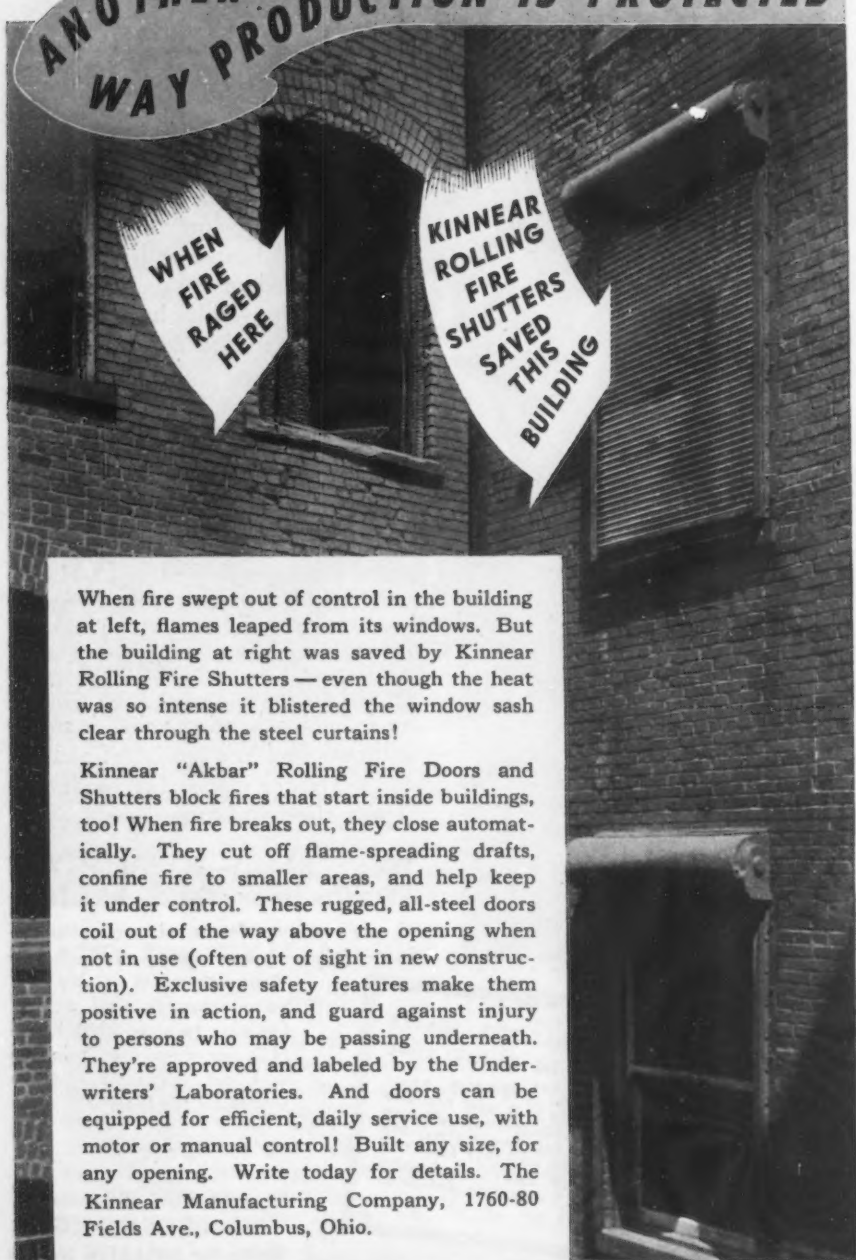
Cleveland

••• Expectations that Lake shippers may move 88,000,000 to 90,000,000 gross tons of ore this season were strengthened as the 1942 movement got underway with an unprecedented total of 792,558 gross tons moved during the latter part of March, when Lake shipping was given the earliest start in its history. Accompanying

the movement reported by the Lake Superior Iron Ore Association, was the favorable news that the weather continues mild, so that practically all of the ore fleet is now in service.

Two hundred and ninety-one American ships, plus perhaps more than 25 Canadian ships, are likely to participate in the current year's movement, not including five Pittsburgh Steamship Co. new boats, which will operate this year.

**ANOTHER WAY PRODUCTION IS PROTECTED**



**WHEN FIRE RAGED HERE**

**KINNEAR ROLLING FIRE SHUTTERS SAVED THIS BUILDING**

When fire swept out of control in the building at left, flames leaped from its windows. But the building at right was saved by Kinnear Rolling Fire Shutters — even though the heat was so intense it blistered the window sash clear through the steel curtains!

Kinnear "Akbar" Rolling Fire Doors and Shutters block fires that start inside buildings, too! When fire breaks out, they close automatically. They cut off flame-spreading drafts, confine fire to smaller areas, and help keep it under control. These rugged, all-steel doors coil out of the way above the opening when not in use (often out of sight in new construction). Exclusive safety features make them positive in action, and guard against injury to persons who may be passing underneath. They're approved and labeled by the Underwriters' Laboratories. And doors can be equipped for efficient, daily service use, with motor or manual control! Built any size, for any opening. Write today for details. The Kinnear Manufacturing Company, 1760-80 Fields Ave., Columbus, Ohio.

**SAVING WAYS  
IN DOORWAYS**

**KINNEAR**  
ROLLING DOORS

## Telegram from General Gingers Tank Workmen

••• A telegram from Lt. Gen. Brenon B. Somervell to W. O. Lippman, works manager of the Westinghouse Electric & Mfg. Co., East Springfield, Mass., is typical of many sent to other manufacturing plants to spur workmen on to greater effort and greater pride in their work. The telegram:

"War Department has just been informed that a single British brigade in Libya equipped with United States M-3 light tanks halted for entire day a combined attack of two German panzer divisions with bigger and more heavily armored tanks."

Westinghouse workers are turning out equipment for M-3 tanks.

## Secretaries of Engineering Societies Form Organization

••• During the Eleventh Annual Conference of Secretaries of Engineering Societies which met in Detroit, March 30-31, a permanent organization was formed to be known as "The Council of Engineering Society Secretaries." Officers of the organization were elected as follows: chairman, K. F. Treschow, Engineers Society of Western Pennsylvania; vice-chairman, Arthur F. Mellen, The Engineers Club of Minneapolis; secretary-treasurer, O. Laurence Angevine, Rochester Engineering Society; directors, E. L. Brandt, two year term, Engineering Society of Detroit, and H. S. Harris, one year term, Engineers Club of Philadelphia. The next meeting will be in Pittsburgh in March, 1943.

## 200 Sharon Steel Corp. Employees Are Drafted

••• Sharon Steel Corp. will "continue its policy of developing alloy steels and coated products," although it is now fully engaged in producing steel for the war, according to Henry A. Roemer, president. Net earnings in 1941 amounted to \$1,633,000, resulting from finished products shipments of \$32,000,000. Taxes for 1941 were \$2,650,000 and expenditures for plant improvement amounted to \$1,911,000. Present employees total 3780, and the annual payroll rate is \$7,752,000. Company reports that more than 200 employees have joined the nation's armed forces.

## Six Autos Melted In Scrapping Test

Rochester, N. Y.

••• The melting of six complete junked automobiles, cut to cupola charging size, was witnessed here Saturday by a number of steel company metallurgists, local WPB representatives and industrial executives. The demonstration was held at the Hetsler Foundries on Villa Avenue, by the National Smelting, Refining & Machine Corp. of Buffalo to indicate the feasibility of the corporation's plans to melt entire automobiles, without cutting up or dismantling, in cupolas 108 ft. high and 12 ft. in diameter. National is seeking financing for the erection of a number of plants to carry on such work.

The automobiles, before being charged, were cut up into sizes to permit charging into a medium-sized cupola. All the parts were retained, except tires, battery, upholstery, glass and the copper radiator. The motors were charged in one piece, without being stripped. A representative of the Charles C. Kawin Co. of Chicago, independent consulting metallurgists, checked the charging operation and the pouring of test pieces.

Previous tests of a similar nature were reported by the Kawin Co. to have resulted in a metal analyzing as follows: Si 0.28; graphitic C 0.02; combined C 2.40; T.C. 2.42; P 0.051; S 0.143; Cr 0.09; Ni 0.13; Cu 0.69. The following elements were found in amounts of less than 0.01 per cent: Sn, W, V, Mo, Sb, Cd, Pb, Mg and Zn. This metal had a very white structure and a breaking load value of 5000 to 7000 lb. per sq. in.

Saturday's test was conducted in an ordinary cupola with 16 oz. blast and a 1:7 coke ratio. Limestone was used for slagging. About 13,000 lb. was charged, with the spout temperature averaging about 2600 deg. F. The metal was cast into sand pigs.

A metallurgist of one of the leading steel companies who witnessed the demonstration told THE IRON AGE that from the metallurgical viewpoint, the use of such metal was quite practical. The only problems he foresaw was the reduction of the Cu and S content. The deciding factor in determining the value of the process, he said, was in the price the steel mill or foundry

would have to pay for such pigged scrap.

Officials of National Smelting did not indicate what the selling price of the material would be. It was the general impression, however, that such material would not come under OPA's scrap price ceilings.

National Smelting plans, when adequate financing is obtained, to erect a series of plants with sufficient equipment to permit the charging of entire automobiles,

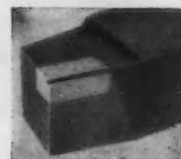
with only the tires, radiator and batteries removed. By eliminating the need for cutting up the car, it is claimed that junked cars can be economically used. Each of the cupolas scheduled for such plants will, company officials said, be able to handle 300 cars daily. The company is also said to be considering the use of a converter to further refine the metal. Each car of such pigged scrap shipped to a user would be accompanied by a chemical analysis.

## Interrupted Cuts — WON'T INTERRUPT PRODUCTION

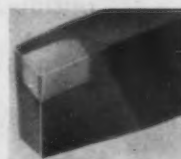
When KENNAMETAL is in the tool rest



STYLE 21 TOOL



STYLE 11 TOOL



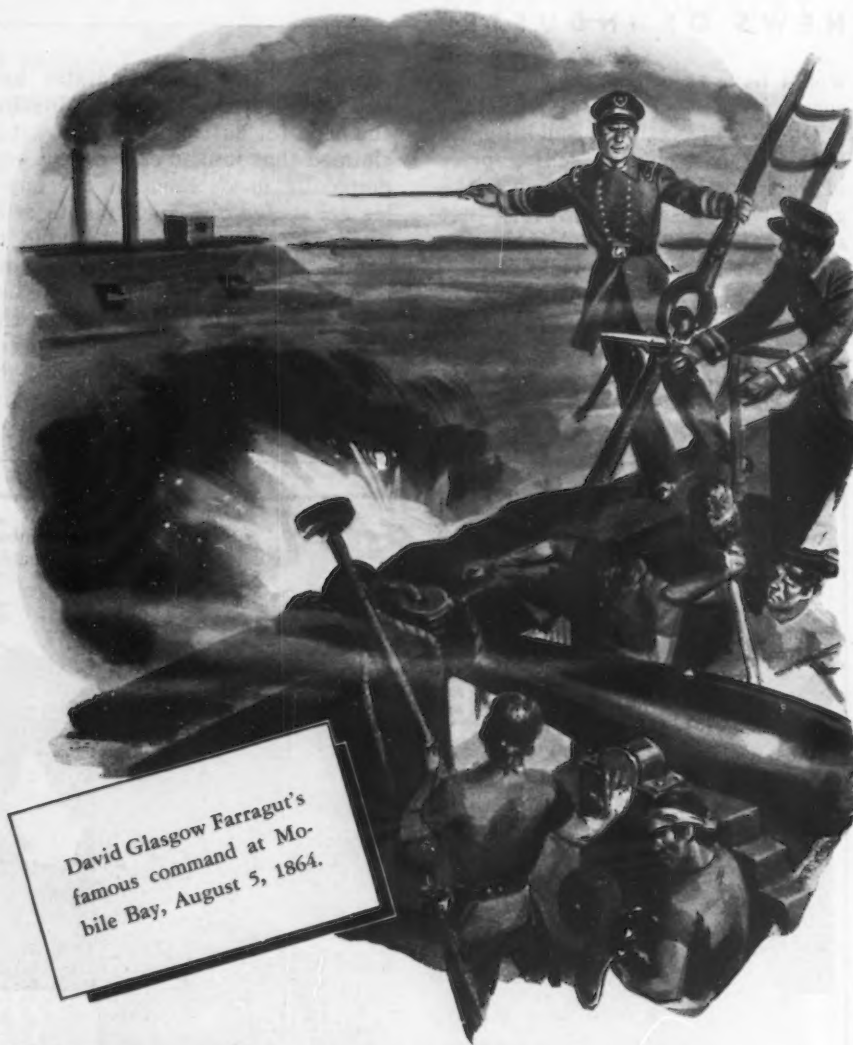
STYLE 19 TOOL

Because of its superior tensile strength (305,000 lbs. per sq. in.) KENNAMETAL can be used in making interrupted cuts without danger of tool breakage. The illustration shows four KENNAMETAL Style 11 tools machining a cast armor steel tank rotor on a 48" x 84" engine lathe. Turning speed is 165 surface ft./min. with a feed of 0.014" per rev. and a depth of cut ranging from 1/4 to 1/2". Large 1" x 2" tool shanks are employed to provide adequate support for the KENNAMETAL tips and the tools are staggered so that only one tool hits the work at a time.

If interrupted or jump cuts are causing excess tool breakage and consequent delays in your plant, investigate the superior strength, hardness and crater resistance of KENNAMETAL. Write for free copy of the new vest pocket manual for KENNAMETAL users. It explains in detail how to get the utmost in production from your KENNAMETAL tools.







David Glasgow Farragut's  
famous command at Mo-  
bile Bay, August 5, 1864.

## "Damn the Torpedoes"— GO AHEAD!

With eloquent disregard for precedent and obstacles American industry drives irresistibly forward with raw material production records that amaze even the most optimistic. Preparedness has become the American way of life, with men, materials, money and facilities dedicated to a single purpose. Paraphrasing the words of the illustrious Farragut, industry has made its slogan, "Damn the Obstacles. Let's Go!"



DIVISIONS  
THE NEWPORT ROLLING MILL COMPANY  
THE GLOBE IRON ROOFING & CORRUGATING CO.

Basic Open-Hearth Alloy Steel Billets and Slabs

### War Contracts Awarded

... Below is a New York State list of government contracts recently awarded, some of which may require subcontract work. If you are a New York state manufacturer and are interested in obtaining work on a subcontract basis, write, don't telephone, your nearest WPB Contract Distribution office. In making inquiries concerning any of the following items, please refer to the letters and numbers given in the second column.

Contract Item	Firm
Cartridges	NAM-2101
Motor trucks	NAM-2102
Chains	NAM-2103
Wire	NAM-2106
Toasters, electric	NAM-2108
Fans, blower	NAM-2111
Anchor	NAM-2112
Locomotives	NAM-2121
Station wagon	NAM-2123
Locks	NAM-2124
Brass	NAM-2125
Steel	NAM-2126
Chain	NAM-2401
Pipe, iron	NAM-2402
Pipe, steel	NAM-2403
Tin, ingot	NAM-2404
Tractors	NAM-2405
Trainer, gunnery	NAM-2406
Valve assemblies	NAM-2409
Refrigerating units	NAM-2410
Hammers	NAM-2411
Drawers	NAM-2412
Cartridge starters	NAM-2417
Trucks, motor	NAM-2418
Reamers	NAM-2420
Generators, turbo	NAM-2421
Valves, cast	NAM-2424
Condenser	NAM-2426
Alidades	NAM-2427
Boats	NAM-2434
Cap assemblies	NAM-2435
Tachometers	NAM-2437
Stills, water	NAM-2439
Lathes, drills, etc.	NAM-2440
Machine tools	NAM-2441
Amplifiers	NAM-2501
Clocks	NAM-2502
Trucks	NAM-2503
Cleaners, vacuum	NAM-2504
Locomotives, electric	NAM-2506
Tableware	NAM-2507
Chain	NAM-2508
Station wagons	NAM-2510
Tableware	NAM-2511
Trucks	NAM-2512
Coils	NAM-2514
Ware, silver	NAM-2515
Ware, silver	NAM-2516
Ware, silver	NAM-2517
Pipe	NAM-2518
Tableware	NAM-2519
Dies	NAM-2521
Air conditioning units	NAM-2522
Boats	NAM-2523
Clocks	NAM-2524
Slide rules	NAM-2601
Extinguishers	NAM-2602
Silverware	NAM-2603
Silverware	NAM-2604
Aluminum tubes	NAM-2605
Lathes	NAM-2606
Cranes	NAM-2612
Extinguishers	NAM-2613
Extinguishers	NAM-2614
Magnetos	NAM-2701
Chain	NAM-2703
Tin	NAM-2704
Recorders	NAM-2705
Caps	NAM-2706
Cartridge tanks	NAM-2707
Motor trucks	NAM-2708
Station wagons	NAM-2709
Board, fibrous	NAM-2710
Lockers	NAM-2716
Sound equipment	NAM-2717
Water purification & softening unit with water testing outfit, etc.	NAC-13502

Contract Item	Firm
Annealing furnace .....	NAC-13504
Refrigerators, cooling equipment, etc. ....	NAC-13506
Compass parts .....	NAC-13509
Surgical suture needles .....	NAC-13602
Instrument trays .....	NAC-13604
Sperry gyro compass parts .....	NAC-13605
X-ray unit .....	NAC-13606
Hand cutting torches .....	NAC-13607
Stainless steel ignition cable .....	NAC-13608
Generators .....	NAC-13610
Developing cabinets .....	NAC-13611
Adjustable dies, hand taps, etc. ....	NAC-13612
Tractors .....	NAC-13702
Landing gears & spare parts .....	NAC-13706
Pallets .....	NAC-13708
Steel dies & die plates .....	NAC-13802
Turbine spare parts .....	NAC-13803
Wrought fittings, etc. ....	NAC-13804
Low platform trucks .....	NAC-13806
Black steel pipe .....	NAC-13807
Trucks, fork .....	NAC-13810
Balancing machines & demonstrators .....	NAC-13811
Ventilation heaters .....	NAC-13812
Electric refrigerators .....	NAC-13901
Fire engine .....	NAC-13902
Shearing machines .....	NAC-13903
Steel sheets .....	NAC-13906
Manila hawsers & port towing springs .....	NAC-13907
Anchor for commissioning outfit .....	NAC-13908
Lift trucks .....	NAC-13909
Steel rivets .....	NAC-13910
Marker light sets .....	NAC-13911

**WHITE STAR FOR 168-HR. WEEK:** Machines in the huge Bofors 40 mm. anti-aircraft gun plant of the Firestone Tire & Rubber Co., are tagged with white stars when they work 24 hr. a day, 7 days a week. In one line of 14 machines, eight have already received the flag. This machine is completing bronze ring-gears for the anti-aircraft gun carriage.



## A One Minute Quiz That May Result in Savings for Your Plant

(and at the same time help to conserve defense materials)

### Q. What is manganese steel?

A. Genuine manganese steel is an alloy of manganese, carbon and iron, containing 10.0 to 16.0% (usually 13.0%) manganese, which is austenitic after heating and quenching. So-called "manganese steels" containing 1.5 to 2.0% manganese do not have the same properties.

### Q. Briefly, what is the history of manganese steel?

A. (a) Discovered by Hadfield in England in 1882. (b) Introduced in America in 1892. (c) First made by Amsco in 1906. (d) First produced in the electric furnace in 1919. (e) Still "The Toughest Steel Known" in 1942.

### Q. What are the physical properties of cast heat-treated standard manganese steel?

A. High tensile strength and ductility, unequalled toughness and work-hardening property. See Page 10 of Amsco Catalog No. 59.

### Q. Is manganese steel hard?

A. Its initial hardness (185-200 Brinell) is little greater than that of ordinary cast steel, but under repeated impact the surface hardness increases immensely, reaching at the point of embrittlement a maximum of 550 Brinell. The surface hardness so obtained is continuously renewed so long as the service continues, while the body metal retains its original toughness.

### Q. Is manganese steel brittle?

A. As cast, before heat treatment, it is as brittle as cast iron, but after heating and quenching it has a greater toughness than any other steel.

### Q. Why is manganese steel tougher than any other steel?

A. The extremely cohesive structure known metallurgically as austenite, acquired from the heating and quenching process, is in manganese steel very strong and ductile, which two properties combined constitute toughness.

### Q. Why is manganese steel so remarkably wear resistant under impact and abrasion?

A. The metal structure becomes increasingly hard and "set" in the areas stressed, in proportion to the repetition and severity of attack. Without such cold-working it is about as abrasion resistant as tool steel or chilled cast iron.

### Q. Why will manganese steel resist shock stresses?

A. Because its high tensile strength and unusual ductility in combination, meaning toughness, enable it adequately to resist shock stresses and yet to yield or deform under heavy impacts rather than to break. Such deformation, however, is not continuous because cold-working raises the yield strength in stressed areas.

### Q. Can manganese steel be welded?

A. For building up to compensate for wear, manganese steel can be welded with nickel-manganese steel welding rod; and for repairing fractures either that rod or stainless steel rod is successfully used. Less

care is necessary, to avoid degradation by extensive overheating, on nickel-manganese steel parent metal than on standard manganese steel. It can be hard-surfaced.

### Q. Can manganese steel be machined?

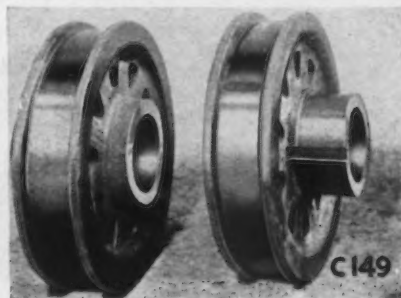
A. Standard manganese steel can be cut with special tool steel or cemented carbide tools, but special technique and equipment are required. Attempting to tool by ordinary methods merely results in work-hardening the steel at the point of contact and wearing out the tool with little result. Practically all machining on manganese steel is done by grinding.

### Q. What special value has manganese steel?

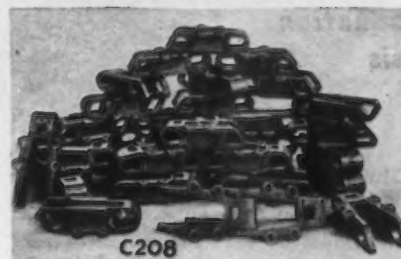
A. Wherever metal is required to combat abrasion associated with heavy repeated impact, standard manganese steel resists breakage much better than ordinary steel and usually has from twice to ten times the wearing life.

### Q. What industries use manganese steel?

A. Among others, cement, clay products, coke and iron, construction, dredging and excavating, foundry, glass, logging, mining, petroleum, quarry, sand pit and steel.



Overhead Crane Wheels of Amsco "Double Wall" Design. (C-149)



Apron Feeder Chain (C-208)—one of many types of impact and abrasion resistant conveying chain Amsco produces for many industries.



Split Sprockets (C-563)—typical of the wheels, gears, pinions, rollers made by Amsco for use where shock, wear or heavy loadings are encountered.

**Amsco**  
AMERICAN MANGANESE STEEL DIVISION  
OF THE AMERICAN BRASS SHOT & FOUNDRY CO.  
Chicago Heights, Illinois

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO. OFFICES IN PRINCIPAL CITIES

Manganese Steel Castings for shocks and abrasion.  
Chromium-Nickel Alloy Castings for heat and corrosion resistance.  
Power Shovel Dippers, Dredge and Industrial Pumps.  
Welding Materials for reclamation and hard-surfacing.



**WPB End Use Code**

••• In an effort to obtain a clearer picture of where material obtained under preference ratings is used, WPB is planning to employ an "End Use Code" which requires consumers of various materials to indicate the final use of the material for which they are seeking a priority rating. The code numbers listed below show how WPB plans to break down the various consuming channels. Do

not use this code until specifically directed to do so by WPB. For a detailed description of this code see THE IRON AGE, March 26, page 80.

**Class 1.00—Military****Aircraft—Production and Maintenance (complete except for armament and ammunition)**

- 1.11 Bombers—Heavy and Medium.
- 1.12 Bombers—Dive, Light, Scout, and Torpedo.
- 1.13 Fighters.
- 1.14 Observation and transports.

- 1.15 Training and all others.

**Ammunition—Production and Maintenance (complete items)**

- 1.21 Ammunition 20 mm. and above.
- 1.22 Ammunition, small arms below 20 mm.
- 1.23 Bombs, depth charges, mines, and torpedoes.
- 1.24 Propellants, chemicals, explosives.
- 1.25 Pyrotechnics.

**Armament and Weapons—Production and Maintenance (complete with mounts and related equipment)**

- 1.31 Aircraft.
- 1.32 Anti-aircraft, Barrage Balloon equipment; A. A. Searchlight.
- 1.33 Artillery, including railway and seacoast.
- 1.34 Fire control, all types.
- 1.35 Machine guns — ground, hand arms.
- 1.36 Naval, all types.
- 1.37 Tank and Anti-tank.
- 1.38 Weapons and all other types.

**Ships—Production and Maintenance (complete except for armament and ammunition)**

- 1.41 Aircraft Carriers, Battleships, Heavy Cruisers.
- 1.42 Destroyers, Light Cruisers, Corvettes and Sub-chasers.
- 1.43 Freighters, Tankers, and Transports — Army and Navy only.
- 1.44 Ships for Maritime Commission.
- 1.45 Mine layers, sweepers, planters, and patrol torpedo boats.
- 1.46 Submarines.
- 1.47 All other ships and boats, including small special purpose boats.

**Vehicles — Production and Maintenance (complete except for armament and ammunition)**

- 1.51 Tanks and armored vehicles—all types.
- 1.52 Vehicles, except rail—all other military types.

**War Equipment and Supplies—Production and Maintenance (complete with related equipment)**

- 1.61 Chemical Warfare equipment and supplies.
- 1.62 Clothing, general supplies and subsistence.
- 1.63 Mapping, Map reproduction and photographic equipment.
- 1.64 Military field construction equipment.
- 1.65 Military radio and wire communications.
- 1.66 Military railway including rail vehicles and bridge equipment.
- 1.67 Radar or electronic equipment—all types.
- 1.68 Supplies and equipment—all other military types.

**War Facilities—Construction and/or Maintenance**

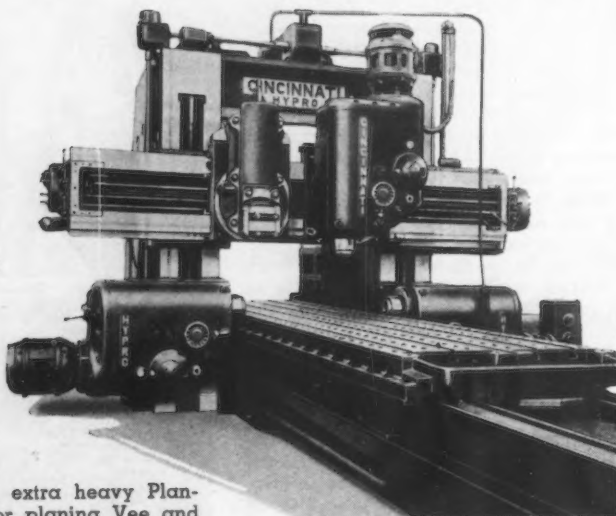
- 1.71 Air Fields, Bases, Camps, Coast Defense, Depots, Forts, Navy Yards, Posts, Stations.

# Cincinnati

## HYPRO

### COMBINATION PLANING AND MILLING MACHINES

**Planing and Milling with Same Machine on a High Production Basis**



Multiple Tools in extra heavy Planing Head used for planing Vee and Flat and rugged Milling Heads with individual 20 H.P. motors, have reduced production time over 50% on grinder beds. This is only an example of time that can be saved with a machine of this type. Machine illustrated is of entirely new design, incorporating individually driven 9½" Quill Milling Heads providing spindle speeds of 10 to 200 R.P.M. capable of handling cutters over 18" in diameter.

A wide range of planing speeds is provided to the table through separate planer motor and control. Machine can be instantly changed from milling to planing by movement of selector switch or control handle. If you are interested in placing precision milling and planing on the same machine, the new Hypro Combination Machine merits your close attention.

**Full Particulars Sent on Written Request.**

**Ask for our new bulletin No. 105.**

**PLANERS • PLANER MILLERS • BORING MILLS**  
**THE CINCINNATI PLANER CO.**  
**CINCINNATI, OHIO**



NAVY "E": Commander G. H. Bowman, U. S. Navy (retired), chief of Cincinnati District Inspection Office, is presenting Edward "Bud" Sand of the Cincinnati Milling Machine Co., with the Navy "E." Bud has been with the company for more than 58 years.

- 6.40 Printing and Publishing.
- 6.90 All other Communication.
- Class 7.00—Public Health and Safety**
  - 7.10 Sanitary and Health Systems and Facilities, Construction and Maintenance of
  - 7.20 Health Equipment and Supplies including Personal Care.
  - 7.30 Public Safety Equipment and Supplies.
- Class 8.00—Agricultural Equipment and Supplies**
- Class 9.00—Industrial Food Processing**

- Class 10.00—Textiles and Wearing Apparel**
- Class 11.00—Education, Recreation, and Amusement**
- Class 12.00—Equipment and Supplies for Domestic Use**
- Class 13.00—Equipment and Supplies for Office Use**
- Class 14.00—Machinery and Equipment for Industrial Use**
- Class 15.00—Repair, Maintenance, and Operating Supplies Not Identifiable as New Construction**
- Class 16.00—All Other Identifiable End Uses**
- Class 17.00—End Use Unidentifiable**

## A New BULLETIN on

# PRESSES



**YOU'LL  
WANT IT!**

You'll want this last-minute data! It shows how to avoid many a war-production bottleneck . . . gives complete facts on presses for a wide range of operations. The Denison HydrOilic Presses it describes are handling production jobs of all kinds with the smooth, accurate efficiency of oil hydraulic operation. You can get the **POWER, SPEED and CONTROL** your production calls for with these two- to 100-ton HydrOilic presses. We'll rush this Bulletin No. 109 to you immediately on receiving your request, written on your business letterhead. Write today, or get in touch at once with your Denison representative. The DENISON ENGINEERING CO., 1158 Dublin Road, Columbus, Ohio.



- 1.72 Munitions manufacturing facilities and proving grounds — government owned.
- 1.73 Panama Canal.
- 1.74 Shipyards and ship repair facilities—government owned.
- Class 2.00—Raw Materials, Production and Processing of**
  - 2.10 All Metals, Production (including mining) Smelting and Processing of
  - 2.20 All Chemicals, Production and Processing of
  - 2.30 All other Raw Materials, Production and Processing of
- Class 3.00—New Buildings, Construction of**
  - 3.10 Buildings for Manufacturing and Commercial Purposes, Construction of
  - 3.20 All Types of Dwellings, Construction of
  - 3.90 All other Types of Buildings, Construction of
- Class 4.00—Power, Light, and Heat**
  - 4.10 Electricity.
  - 4.20 Petroleum.
  - 4.30 Coal and Coke.
  - 4.40 Gas.
- Class 5.00—Transportation**
  - 5.10 Railroad including Urban and Interurban.
  - 5.20 Automotive.
  - 5.30 Roads, Streets, etc., Construction and Maintenance of
  - 5.40 Water Transportation, including construction of privately owned shipyards.
  - 5.50 Air Transportation.
  - 5.90 All other Transportation.
- Class 6.00—Communication**
  - 6.10 Telephone.
  - 6.20 Radio.
  - 6.30 Telegraph.



### Nazis' 18-Cylinder Plane Motor Begun 7 Years Ago

••• Seven thousand drawings and almost 28,000 different jigs were needed before the new B.M.W. 802 18-cylinder radial air-cooled aero-motor was put into production. These figures were given in a series of articles in German newspapers, all of which are lavish in their praise of the new type.

According to these articles

B.M.W. began work on the design seven years ago. Its manufacture is planned on principles similar to those used in motor car factories, and extensive use is made of conveyor belts and unskilled labor. On one machine 140 holes of varying depths and sizes are drilled in a single operation. Processes that once took a skilled man four hours are now done in a few minutes by unskilled operators. There are 16,000 parts, and their production and

assembly is divided into "Takts" (timed systems).

The inspection and testing of the new motor is stricter than that of previous models. It undergoes a test run of at least 6 hr., and is then taken to pieces for a thorough inspection. It is reassembled and subjected to a final test running.

The Focke-Wulf Fw 190 single-seat fighter is one of the first German types to have the new motor.

### Riehle to Discontinue Line of Testing Machines

••• America's oldest builders of physical testing machines, the Riehle Testing Machine Division of American Machine and Metals, East Moline, Ill., has discontinued manufacturing the major part of its line of tension-compression testing machines. Orders on the books for this equipment which carried an A-1-c priority rating or better, will be filled, but no further commitments are being made. The company will continue to manufacture several smaller testing machines on which they are in quantity production. It is believed that the plant will begin manufacture of a new line of machinery.

### Amalgamated Prepares For Curb on Strikes

Pittsburgh

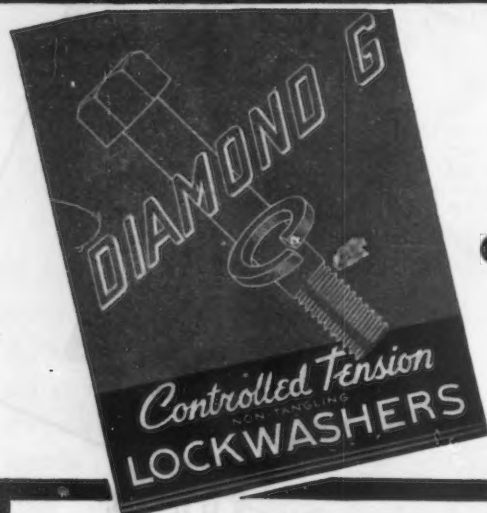
••• The Amalgamated Association of Iron, Steel & Tin Workers here has threatened a revocation of union memberships and charters if any members or lodges of the Amalgamated violate the no-strike pledge of labor to President Roosevelt. This warning included slow-ups or stoppage of war production.

### Building Costs Rise

Cleveland

••• The Austin Co. index of factory building costs advanced two points to 114 during the first quarter of 1942. This gain reflected increases in the average cost of lumber, recent freight rate adjustments, and rising labor costs. George A. Bryant, president, stated the differential between the present index level and the peak of 135 reached during the first World War is particularly significant in view of the fact wage rates and material prices are considerably higher today than they were at that time.

## NEW FACTS you should know about LOCKWASHERS



GIVES  
"How and why"  
OF LOCKWASHERS

### REAL INFORMATION THAT WILL HELP YOU SPEED UP PRODUCTION!

What should a lock washer do? How can its effectiveness be improved? How can one washer take the place of two? These and many other questions are answered in this new DIAMOND G Lockwasher data piece! It's yours for the asking . . . no charge . . . no obligation. Write for it today . . . and if you need high quality lock washers right now

send along your order with your request. We're ready to give you immediate deliveries on DIAMOND G LOCKWASHERS . . . and that quick selling sensation the new Double Duty Lockwasher.

GEORGE K. GARRETT COMPANY  
1421 Chestnut St., Philadelphia



## DIAMOND G LOCKWASHERS

## OPA Announces Schedule Covering Iron Ore Prices

Washington

... Announced on Tuesday, OPA's price schedule for Lake Superior iron ore, effective April 10, fixed the Lake Erie 1941 season price of \$4.45 per gross ton for 51.50 per cent Mesabi non-Bessemer, delivered lower Lake Erie ports as a base for relating prices of ores of different grades, as well as for calculating discounts. At the same time, however, the regulation forbids sales of ore under continuing long term contracts at prices exceeding those at which deliveries were made last season. The schedule does not cover sales of captive ore.

Normally the bulk of all market ore moves under long term contracts and to the extent that this prevails this year, the 1942 price will be unchanged from 1941. Ore from new mining operations will sell at the \$4.45 base price.

But it is predicted that there probably will be more spot than long term tonnage moved this season and it will be sold under a weighted average based on sales of last year. Hence, while many sales will be made at the \$4.45 base price it is also true that sales will be made at prices as low as \$4.15 or less.

This is seen in the provision that in the case of long term contracts that expired at the end of last season and are up for renewal, it is required that the seller base his maximum price on the weighted average at which his spot or one-season sales were made in 1941. The maximum price to be charged under the new spot contracts for the 1942 season must be computed similarly.

For price purposes the regulation makes inoperative all escalator clauses in existing contracts. These clauses, in general, provide for automatic price advances to the extent that certain increases in costs, such as transportation, occur.

When ore is sold F.O.B. Upper Lake Port, the maximum price cannot exceed the lower lake price, less lake freight. In cases where ore is sold F.O.B. mine, the maximum price cannot be above the lower lake price, less lake freight and rail freight.

In order to stimulate the record movement of 90,000,000 tons of lake ore this season, the

regulation carries a special provision to make the opening of new operations attractive from a standpoint of price. Ore shipped from a mine which was idle in 1940 and 1941 and from which no ore was shipped except from a stockpile may carry a maximum price equivalent to the \$4.45 base. But before any sales on this basis can be made, the producer

must file with OPA an affidavit describing the operation and must await written OPA permission before proceeding with any sale at the \$4.45 price.

New sellers—those who did not sell ore during the 1941 season—must price their ore at a figure not above that weighted average spot price of a seller situated in substantially similar circumstances.

To enable producers to adjust maximum prices of natural iron content, the regulation—No. 113—contains a table listing the base price of each of the main classes of ore.

The provisions of the present regulation apply only to market, merchant and non-captive



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is another name for highest quality Forgings . . . The reason? Advanced metallurgical control, thorough engineering understanding and practice, modern facilities, prompt attention to the minutest of details . . . all these are summarized by the phrase "One Responsibility, One Control" . . . Your Forgings, from the raw material to finish machined product, are produced entirely within the confines of the Erie Plant . . . Today, it's Defense! Tomorrow, the products of Peace and Prosperity! . . . You are assured of the results you demand when you place your requirements with the

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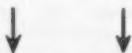
ERIE FORGE COMPANY, ERIE, PA.

★ ★ ★ ★ ★ ★ ★ ★





ore. OPA said that it plans immediately to institute an investigation covering sales of captive ore with a view to taking any appropriate action that may be necessary.



### Lake Vessel Rates Raised

Cleveland

•••Iron ore observers report that the increase of 3c. a ton made by three independent fleets to move iron ore from the head of Lake Su-

perior to the lower lakes may become a fairly general move by all lake shippers, thereby increasing the port-to-port rate from the Lake heads from 77c. to 80c. The move is said to be subject to approval by Washington, and reflects the increased costs faced by lake shippers this year. Unlicensed seamen on lake boats are slated to receive a 10 per cent wage increase. Insurance rates on shipping have been boosted 10 per cent. Expedi-

ency will force the diversion of much grain and some of the coal movement to railroad transportation.

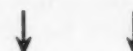
It is reported some shippers had sought an increase in the ore rate to 85c. a ton from port-to-port, but that Federal officials rejected this proposal. Accordingly, the 80c. rate may be a trial compromise depending upon Washington's reaction. Moreover, this step may indicate a pending increase in the lake coal rate.



### Plan for Wage Ceiling

•••A proposal aimed at curbing wages appears likely to be forthcoming soon from WPB labor officials. Probably they will seek to avoid an overall freezing due to inequalities existing between various industries.

With provisions to permit adjustments, advances from existing levels in the lower wage brackets would be allowed if necessary. The question of wage control is tied to manpower mobilization. Rent control is not considered particularly pressing at the present time.



### Roads Reject OPA Plea

•••The Association of American Railroads announced Monday that it had refused the request of OPA that the carriers voluntarily forego the higher freight rates on certain commodities granted to them by the ICC.



### Schedule 49 Revised

•••Sellers of merchant wire products are allowed a higher markup over mill prices; mixed carloads are redefined, and Pacific Coast resale prices have been amended to reflect transportation conditions. These are among the principal changes in Price Schedule 49 (resale of iron and steel) effected in Amendment No. 2, issued April 2.

A jobber, in determining the selling price for merchant wire may use the higher of two figures:



## Rely on LEATHER!

• Hydraulic mechanisms require packings which will seal effectively at all times. • For example, huge hydraulic presses exert tons of pressure evenly and gently, with the aid of VIM Leather to seal the hydraulic medium used. • You'll find these packings on the firing line too, in recoil mechanisms of guns, where they enable absorption of the shock of firing. • Wherever hydraulics are involved, you'll find VIM Leather Packings will do you a better job of longer, trouble-free service. What's your packing problem?

E. F. HOUGHTON & CO.

Chicago

PHILADELPHIA

Detroit

Houghton's **VIM LEATHER** packings

(a) selling prices on April 16, 1941, as established in the schedule, or (b) 20 per cent above the mill carload price to him.

Because the April 16 prices very often reflected mill discounts which have since been withdrawn, OPA said the present amendment was necessary to prevent sales at prices so low as to result in a general loss to many jobbers.

The 20 per cent mark-up is the approximate figure upon which several applications for relief have been based and on which OPA has acted in granting relief in some individual cases. OPA said it would make further studies but that the 20 per cent markup represents, rather than a ceiling, a floor beneath which April 16 prices need not fall.

The Pacific Coast provisions of the schedule have been amended to reflect changes in ocean shipping and more complete information on all-rail shipments from the East since the price schedule was adopted last December.

Pacific Coast jobbers last June imposed a charge of 80c. per hundred pounds for additional shipping costs on a list of plates, sheets, and strip. In adopting the price schedule in December, OPA cut the charge to 35c. per hundredweight. The amendment eliminates this average allowance and substitutes the following list of maximum freight allowances on specified products:

(Per hundred pounds)

Plate, universal and sheared, carbon, and floor—75c.

Hot rolled sheets, carbon—65c.

Cold rolled sheets—65c.

Hot rolled bars and small shapes, carbon (exclusive of concrete reinforcing bars)—20c.

Galvanized, galvanized and enameling sheets—45c.

Hot rolled strip, carbon—25c.

Structural shapes, carbon—45c.

OPA reported that a freight allowance for individual products was more equitable than an average allowance for the group of products. The amendment added another product to the list, cold rolled sheets.

In simplifying administrative procedure, OPA directed that only sellers covered by the price schedule need file reports.

Redefined "mixed carloads" to conform more closely to usage in the industry, and established a maximum price for inventory held by a manufacturer who is unable to use it because of curtailment of product by governmental orders.

While clarifying the status of

retailers, OPA at the same time warned that jobbers who maintain they are retailers in order to obtain exemptions from the schedule must be prepared to demonstrate that they customarily have been engaged in retail business, as that term is commonly understood. The mere fact of selling to industrial consumers does not establish a person as a retailer.

The amendment also sets up a simplified procedure for filing a

petition for exception under the price schedule.

Establishment of a uniform resale price schedule for the Pacific Coast has been made more difficult because of the widely varied sources from which Pacific Coast steel warehouses draw. Warehouses able to obtain goods from Pacific Coast mills have been and will have a more favorable picture than those forced to obtain goods from distant mills where the dif-

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Parts Like These manufactured by Hubbard are used somewhere in almost every kind of product or mechanism and the usefulness of the product, or the proper functioning of the mechanism, often of vital importance, are dependent upon them.

They are manufactured by Hubbard from steel, brass, bronze and other material... formed, shaped, heat treated, tested and assembled with modern equipment and scientific instruments.

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ferential of rail over water freight is high. Coast mills have been able to supply progressively smaller proportions of the warehouse requirements, however, and warehouses soon will be dependent on Midwest and Eastern mills for practically all requirements. Premiums in the new schedule reflect slightly less than the differential of all-rail over water freight from basing points situated midway be-

tween the nearest and farthest eastern sources of supply.

In the case of galvanized sheets, coast warehouses which have been tied to coast mills under the terms of the order may temporarily profit, but it is believed that the decreasing ability of local mills to supply them will force these warehouses to seek permission to purchase from eastern sources if any stocks are to be maintained.

## Cast Iron Soil Pipe Change

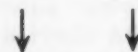
Washington

• • • Manufacturers of cast iron soil pipe and fittings have been given permission by Acting Price Administrator John E. Hamm to compute delivered prices on emergency shipments of less than 250 lb. in the same manner as maximum delivered prices for warehouse shipments are determined. Previously the method of calculating maximum delivered prices for such shipments was the same as for other shipments from foundry to purchaser.

The revised method of calculating maximum prices was provided in Amendment No. 2 to Revised Price Schedule No. 100, Cast Iron Soil Pipe and Fittings. The emergency shipment regarded by the industry as those shipments, usually of fittings, requested of a foundry by a purchaser to supplant parts broken in transit, is included for the first time in the schedule.

To avoid unjustified price increases in some sections of the country, the amendment also specifically requires the use of the lowest railroad carload rate from Birmingham, Ala., in computing maximum delivered prices for all shipments. OPA said that it found that several carload rates were in effect and that the lowest rate, which was intended, had not been used in some cases, particularly on the Pacific Coast.

The amendment now establishes the maximum delivered prices as the Birmingham, Ala., base price plus the transportation charge for the actual weight of the shipment at the lowest railroad carload rate from Birmingham to the place where shipment originates plus actual transportation charges from place of shipment to point of delivery.



## Antimonial Lead

• • • The maximum price of antimonial lead was increased by an amendment to Revised Price Schedule No. 70 (the scrap and secondary lead schedule) issued April 1. The increase amounts to 1½ cents a pound for the anti-

## SAVE VALUABLE WORK HOURS

Perkins Man Coolers keep men cool. Comfortable workers produce more. Give them a steady re-circulation of air.

Perkins Man Coolers are made in stationary and oscillating types, both portable.

**B. F. PERKINS & SON, INC.**

Engineers and Manufacturers

HOLYOKE, MASS.



# PERKINS MAN COOLERS

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mony content of antimonial lead and reflects a similar increase in the price of primary antimony metal recently authorized by the OPA.

Antimonial lead is defined in the schedule as "any lead antimony alloy in the form of pigs or special shapes containing not less than 98 per cent lead and antimony combined; not less than 2 per cent antimony; and not more than 1/2 per cent tin." The maximum price per pound, f.o.b. point of shipment, for any grade or type of antimonial lead sold in pigs in carload lots, according to the amendment, shall be equal to 15 1/2 cents (instead of 14 cents as formerly) a pound for the antimony content, plus the base price of lead for the remainder. The base price of lead varies from 6.35 to 6.55 cents a pound, depending upon the basing point given in the schedule.



### Oxalic Acid

... The reagent grade of oxalic acid (used in comparatively small quantities in laboratory work) is exempted from the provisions of the maximum price schedule by Amendment No. 1 to Revised Price Schedule No. 78 for oxalic acid.



### Exceptions on Prices

... During the past week numerous price order exceptions were granted to firms in the metals and metalworking fields, including:

**Price Schedule 8—Nickel Scrap:** American Nickel Alloy Mfg. Corp., New York, may sell and deliver, and American Manganese Steel Division of American Brake Shoe & Foundry Co. may buy and receive 10,000 lb. of Inconel turnings containing approximately 80 per cent nickel and 14 per cent chromium, at a price not exceeding 28.74c. per lb. of material, f.o.b. Brooklyn.

**Price Schedule 67—New Machine Tools:** Fox Grinders, Inc., Pittsburgh, may sell to National Malleable & Steel Castings Co., Sharon, Pa., three special chain grinding units at \$1,932 each.

**Stokerunit Corp., Milwaukee,** may sell its boring machines at prices higher than those in effect Oct. 1, 1941. The new schedule for this firm ranges from \$9,140 down to \$290.

**Niagara Machine & Tool Works, Buffalo,** is permitted a price ceiling adjustment on several models of power squaring shears. The No. 312 model may be sold at \$2,932 and the No. 34 at \$2,185. The No. 59 single crank press may be sold at \$4,732 and the No. 612-G double crank press at \$10,693. Prices are set on several other units also.

**Price Schedule 46—Relaying Rails:** L. B. Foster Co., Inc., New York, was authorized to deliver 300 gross tons of relaying rails to Aluminum Co. of Canada, Ltd., at \$42.50 per ton, f.o.b. Port Newark, N. J. The rails were acquired by the Foster firm in August, 1941, in excess of the ceiling which was not established until last Dec. 1. The tonnage was sold to the Canadian consumer last Sept. 2.



### Field Offices Added

Washington

... Plans to expand its field operations far beyond the 11 regional offices already established have been announced by the OPA

with the opening of the first group of field offices in 16 cities.

Frank Bane, director of OPA division of field operations, in announcing the new offices stressed their function as a liaison between the public and OPA.

"These new offices," Mr. Bane said, "are opened for the purpose of servicing the public and business in all matters having to do with price administration. They

will be staffed with specialists equipped to render assistance to business groups and with inspectors to develop necessary information as a basis for an adequate system of price administration."

Cities in which the field offices are located and the regional offices out of which they will operate follow:

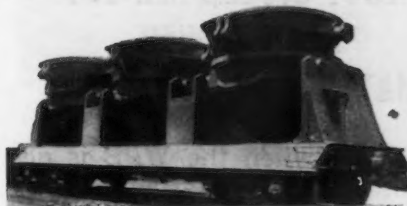
Hartford, Boston area; Newark, N. J., and Buffalo, New York area; Pittsburgh, Philadelphia area; Milwaukee, and Indianapolis,

## News of Industry

Forecast—Faster Production with Probable Savings

# KOPPEL CARS SPEEDING VICTORY PRODUCTION

### 100-Tons Capacity Ladle Car



Triple cylinder, or smaller, of largely welded construction for steel plant service.

## OVER 75 TYPES IN KOPPEL LINE



There are over 75 types of KOPPEL cars for moving any material on wheels. Let us

send you Bulletin No. 71 describing the complete KOPPEL line of industrial cars to help



speed your defense orders. Write today for full particulars!

## KOPPEL STRESSES FIVE FEATURES OF ITS CARS

1. High Pay Load Capacity
2. Quick, Clean Dumping Action
3. Rugged Durability
4. Minimum Maintenance Per Ton
5. High Tensile and Abrasive Resistant Steel Construction when Desired.

Write for Bulletin No. 71

## ... Plant Owners Report Savings in Time and Labor with Koppel Industrial Cars

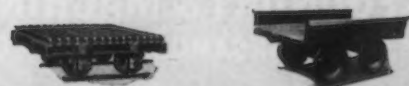
"You can't beat KOPPEL cars when it comes to hauling more material at lower cost," say plant owners throughout industry. These ruggedly built industrial cars move bigger loads faster and at less cost. High carrying capacity, combined with quick, clean dumping action, makes KOPPEL the outstanding car for every industry. Bulletin No. 71 gives complete details.

### 50-Yd. Automatic Air Dump Car



Has increased waste disposal efficiency 60%, and cut initial cost 27% below that of the now out-moded 30-yd. cars.

## Many KOPPEL Cars For Steel Plant Use



**PRESSED STEEL CAR CO., Inc.**  
(KOPPEL DIVISION)  
PITTSBURGH, PENNA.



## PRICES

Ind., Chicago area; St. Louis, Kansas City area; New Orleans and Houston, Texas, Dallas area; Salt Lake City, Denver area; Los Angeles, and Seattle, San Francisco area; and Richmond, Va., Baltimore area.

### Prosecutions Loom

Washington

••• "Flouters," "connivers," "illicit traffickers," and "notorious, flagrant, or willful violators" of OPA rationing regulations were told on March 31, by John E.

Hamm, acting price administrator, that they would be criminally prosecuted.

### Appliance Prices Frozen

Washington

••• OPA last Friday froze manufacturers', wholesalers', and retailer's prices of 44 common electrical appliances at levels no higher than those in effect on March 30. This temporary ceil-

ing effective April 7, will continue until June 5, unless superseded.

The order applies to the following appliances with a rated electrical capacity up to 2500 watts, or powered by an electrical vibrator or fractional horsepower motor:

Biscuit and muffin bakers; bottle warmers; bread toasters; broilers; casseroles; chafing dishes; cigar and cigarette lighters; clothes dryers; coffee makers; corn poppers; curling irons; deep fat fryers; double boilers.

Dry shavers; egg cookers; fan type heaters; fans; flat irons; food and plate warmers; food mixers; griddles; hair clippers; hair dryers; hotplates and disk stoves; immersion heaters; juice extractors; massage vibrators.

Neckwear and trouser pressers; ovens; pads and blankets; percolators; portable air heaters; roasters; sandwich toasters; smoothing irons; table stoves; teakettles and tables; unit radiator heaters; urns; vaporizers; waffle irons; water heaters; whippers.

OPA also prohibited evasion of the order through a decrease in allowances for transportation, and for cash quantity or other discounts, or through an increase in charges for time payments and repair service. Manipulating price increases through pyramiding the Federal excise tax is likewise prohibited.



**Quick POWER CONVERSION!**

**PYOTT OFFERS ALL-OUT HELP TO WAR MATERIAL PRODUCERS!**

Right now, when the WPB is demanding more and faster delivery of everything, is no time to hold out for any particular kind of mechanical power transmission, especially if "holding out" means "holding up" war work. Pyott can offer you speedy delivery of pulleys, permitting employment of present line shaft equipment. Use of sprockets, gears and sheaves in many instances may also eliminate delay. Put your problem up to Pyott for constructive suggestions.

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**FOUNDRY & MACHINE CO.**

328 N. SANGAMON STREET · CHICAGO



SHEAVES · GEARS · PULLEYS  
SPROCKETS · CAST IRON AND SEMI-STEEL FOUNDRY WORK



Pyott Multiple V-Belt Drives conform to all the engineering specifications established by Multiple V-Belt Drive Association.

### Export Price Policy

••• OPA export price policy has been clarified through a joint OPA-BEW statement. In formulation of export price ceilings, the announcement states, the policy of OPA is: (1) to set a fair price covering additional costs involved in exporting; (2) to set a price which is neutral in its effect of distribution of sales between export and domestic markets; (3) to fix export margins at different levels, according to function of

Designation	CHEMICAL COMPOSITION LIMITS					
	Carbon	Manganese	Phosphorus Max.	Sulphur Max.	Silicon	Nickel
NE 8024	.22/.28	1.00/1.30	.040	.040	.20/.35	.....
NE 8124	.22/.28	1.30/1.60	.040	.040	.20/.35	.....
NE 8233	.30/.35	1.30/1.60	.040	.040	.20/.35	.....
NE 8245	.42/.49	1.30/1.60	.040	.040	.20/.35	.....
NE 8339	.35/.42	1.30/1.60	.040	.040	.20/.35	.....
NE 8442	.38/.45	1.30/1.60	.040	.040	.20/.35	.....
NE 8447	.43/.50	1.30/1.60	.040	.040	.20/.35	.....
NE 8547	.43/.50	1.30/1.60	.040	.040	.20/.35	.....
NE 8620	.18/.23	.70/.95	.040	.040	.20/.35	.40/.60
NE 8630	.27/.33	.70/.95	.040	.040	.20/.35	.40/.60
NE 8724	.22/.28	.70/.95	.040	.040	.20/.35	.40/.60
NE 8739	.35/.42	.75/1.00	.040	.040	.20/.35	.40/.60
NE 8744	.40/.47	.75/1.00	.040	.040	.20/.35	.40/.60
NE 8749	.45/.52	.75/1.00	.040	.040	.20/.35	.40/.60
NE 8817	.15/.20	.70/.95	.040	.040	.20/.35	.40/.60
NE 8940	.45/.52	1.00/1.30	.040	.040	.20/.35	.40/.60

**EXTRAS FOR ALLOY CONTENT—**  
agency alternate composition ranges  
nace alloy steels, for bars, bar-strip,

## PRICES

and risks incurred by the seller; (4) to establish export differentials which will not disturb established methods of doing business; (5) to give special consideration to hardship cases; (6) to be liberal when such policy will tend to enable exporters who have suffered losses to maintain contacts for post war period; and (7) to co-operate with BEW in such manner that exporters who appeal ceiling prices will be instructed in most expeditious procedure.



### Plumbing Fixtures Ceiling

Washington

••• Effective April 7 and to continue in force through June 5, Acting Price Administrator John E. Hamm has announced Temporary Maximum Price Regulation No. 17, establishing plumbing fixture prices at levels prevailing on March 30, 1942. The schedule was issued, Mr. Hamm said, in an effort to avert speculative price increases which he declared are likely to follow a forthcoming WPB order curtailing production of certain types of fixtures. The regulation covers "plumbing fixtures of all types, kinds, sizes, shapes and colors, whether made of vitreous china, porcelain, enameled cast iron or formed metal, and their accessories."



### Card on "NE" Steels Out

Pittsburgh

••• Carnegie-Illinois Steel Corp. has issued an insert to its hot

rolled alloy steel list of extras which gives the designation, chemical composition limits, and extra charges for national emergency alternate composition ranges for basic open-hearth and electric furnace alloy steels. It is understood these national emergency alternate composition ranges were established after extensive consultation in order to have steel of suitable quality in case original composition ranges became unavailable because of heavy war

demand. At foot of page are details in chart form, including the extra charges per 100 lb. on the finished steel items and the extra charges per ton on billets, blooms and slabs.

### Otis Plate Mill Sets Record

Cleveland

••• The Otis Steel Co. Lakeside mill broke all previous records for steel plate tonnage produced during the month of March.

## DELIVERY NEXT MONTH!



# NOW IT'S 8!

Aircraft Bushings—thousands of them—with outside diameter held to .0005 tolerance, using stock model roll tool, reamed to .001 tolerance and held to length within .005!

Swift Lubricator Company, of Elmira, N. Y., reports these figures on the top-notch performance of two Simmons No. 2 Turret Lathes purchased late last Fall.

"Very satisfactory," was their comment. And when increasing orders made it necessary to augment the battery of turret lathes, six more Simmons machines were added.

Now it's eight Simmons No. 2 Micro-Speed Turret Lathes on the Swift Lubricator Company's production line.

1,000 spindle speeds through Micro-Speed Drive, secured instantly by Selector Dial Control handwheel.



1 1/4" Bar Capacity—14" Swing, Plain and Back-Geared, Timken Bearings, Spindle Brake. Write today for descriptive bulletin.



## SIMMONS

### MACHINE TOOL CORP.

1721 NORTH BROADWAY, ALBANY, N. Y. New York office: 149 B'way

PER CENT			Basic Open-Hearth		Electric Furnace	
Chromium	Molybdenum	Vanadium	Bars & Bar-Strip	Billets, Blooms, & Slabs	Bars & Bar-Strip	Billets, Blooms, & Slabs
.10/.20			.45c	\$ 9.00	.95c	\$19.00
.25/.35			.85	17.00	1.35	27.00
.10/.20			.65	13.00	1.15	23.00
.10/.20			.65	13.00	1.15	23.00
.20/.30			.75	15.00	1.25	25.00
.20/.40			.90	18.00	1.40	28.00
.20/.40			.90	18.00	1.40	28.00
.40/.60			1.25	25.00	1.75	35.00
.15/.25			.90	18.00	1.40	28.00
.15/.25			.90	18.00	1.40	28.00
.20/.30			.95	19.00	1.45	29.00
.20/.30			.95	19.00	1.45	29.00
.20/.30			.95	19.00	1.45	29.00
.30/.40			1.10	22.00	1.60	32.00
.30/.40			1.35	27.00	1.85	37.00

Chart above shows national emergency basic open hearth and electric furnace billets, blooms and slabs.



## WPB Preparing for Strict Enforcement of Priority Rules

••• After many false starts and empty threats, WPB is apparently finally developing a working plan for policing the multitude of war-time controls over material and machinery distribution now in effect. The corner stone of future enforcement activities will undoubtedly be the industry surveys

being conducted by WPB's Compliance Section. Thus far these surveys have indicated that the chief cause of violations has been a misunderstanding of an order, rather than a deliberate evasion.

When these surveys are completed, WPB will have a fairly clear picture of the size of its policing

job. Added to this data will be the recently acquired power to impose fines of up to \$10,000 and one year's imprisonment for each violation. This club, acquired through the Second War Powers Act, will be used without hesitation, when necessary, WPB made clear last week. J. S. Knowlson, Director of the Division of Industry Operations, pointed out that WPB did not intend to punish violations due to honest mistakes, but that it did intend to use this authority whenever necessary. "We must have compliance, all the way," he said.

Emphasizing "this trend to stricter enforcement of priority regulations" was the action taken last week by WPB against a New York chemical firm, forbidding the company to make further sales of certain chemicals pending an investigation of the firm's records. WPB charged that the company obtained chemicals under a priority rating, but then diverted the material for other non-rated uses.

In addition to surveys covering aluminum, steel, scrap steel, copper and pig iron, the Compliance Section is planning to investigate the use of preference ratings by steel warehouses, private housing builders and chromium and nickel users. A flying squadron of special investigators is being set up to handle special cases and 13 regional offices will be established where preliminary hearings of violations will be held.

Thus far 3500 firms have been surveyed, reports covering 7100 companies are being prepared and investigations of 10,500 additional firms are underway. Of the 3500 completed company surveys, more than 1600 revealed no violations. Approximately the same number were found to have committed minor violations, largely through misunderstandings. Punitive action was taken against 46 firms and one individual.



### Rebuilt Machine Tools

••• In extending to May 1, preference rating order P-77, covering material for the rebuilding of machine tools, WPB has advised companies operating under the order that they will be expected as soon as possible to shift over to the use of the Production Requirements Plan. However, it was stated that some problems have arisen in con-

**TOMKINS-JOHNSON**  
HYDRAULIC CYLINDERS

*Tells*

**MAXIMUM STROKE LENGTHS**  
*in relation to Piston Rod Diameters*

Already figured and charted for you in this catalog are the maximum hydraulic cylinder stroke lengths that can be used with the standard diameter piston rods. If this stroke length does not accommodate the job to be done, an alternate choice piston rod is given with the

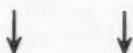
maximum stroke that can be used for that diameter piston rod.

Along with information of equal importance to the user of hydraulic cylinders, this chart is shown in our Catalog H-40. Your copy will be sent promptly on receipt of your request.

**THE TOMKINS-JOHNSON CO.**  
628 NORTH MECHANIC STREET · JACKSON, MICHIGAN

## PRIORITIES

nection with application of PRP to this industry and the extension was designed to permit further study and any necessary adjustments.



### Nickel Allocation

••• Order M-6-a, allocating nickel, was extended indefinitely by amendment on March 30 by WPB. It was due to expire on March 31. Several changes have also been made in the order. The definition of nickel is changed to include any solutions, concentrates and residues from which nickel is commercially recoverable, and nickel salts, oxides and carbonates are added. Nickel may be delivered to the Metals Reserve Co. without specific authorization of the Director of Industry Operations. The definitions of "producer" and "distributor" are eliminated, as the order now applies to all persons alike. Existing forms will continue to be used.



### Laboratory Equipment

••• Preference rating order P-62, covering materials for production of laboratory equipment and reagent chemicals, has been extended by WPB to June 30, at which time it is expected producers will be requested to change over to the Production Requirements Plan. Reports form PD-93 is abolished by the amendment.



### Antimony Use

••• Antimony deliveries to a customer during April must not exceed deliveries to him for either January or February of this year, and no delivery may be made except on orders rated A-10 or higher, according to order L-112 issued last week by WPB. The weight of antimony in alloys must not exceed 0.5 per cent from now on unless specifications call for more, and then the limit is 0.5 per cent additional. Toys, lacquers and enamels, pigments or opacifiers for paints, including all decorative and ornamental objects, may not contain antimony after July 1. Antimonial lead for battery manufacture may not contain more than

7 per cent new metal, of the total used nor more than 7.5 per cent by weight, after July 1. The order becomes effective May 1.

Consumers of antimony are required to file by April 20, and by the 20th of every month thereafter, their orders on Form PD-381 with suppliers, and a report on Form PD-380 with WPB, if they have in stock more than 100 lb. of the metal. Persons requiring small amounts of antimony are not re-

quired to file monthly reports, provided they have filed the inventory report by April 20.



### Shipbuilding

••• In an official interpretation issued Friday, WPB ruled that only material which becomes a part of a merchant ship, and perishable tools, expendable materials



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and temporary equipment used by the shipbuilder in constructing ships can be assigned preference ratings under general preference order P-7.

Order P-7 assigns a rating in favor of the shipbuilder alone "to deliveries of materials consisting of portable or stock tools and equipment of like nature, other than machine tools or similar machinery, required in the construction of the specified merchant

ships," WPB said. In this instance the rating may be applied by the shipbuilder, but not by a rated subcontractor, "to certain additional material, examples of which are portable welding sets, portable air hammers, portable drills, etc., and to ordinary hand tools, even though this equipment is not of a perishable character."

Machine tools and similar machinery are expressly excluded and the rating may not be applied

to them. Likewise, the rating may not be applied to other permanent machinery or equipment, not falling within the categories of "portable or stock tools and equipment of like nature," which will remain usable after all shipbuilding operations have been completed.



## Steel Drums

• • • Moving away from the allocation system to a system of preference ratings through the Production Requirements Plan, WPB has announced this change in the distribution of sheet steel for the manufacture of drums. Heretofore these requirements have been met by allocation, but beginning June 1, they will be obtainable only on preference ratings, except for urgent military needs. Allocations in April and May will be curtailed sharply. WPB said that it is expected drum manufacturers will take immediate steps to obtain necessary preference ratings through PRP.

General preference order M-45 will continue in effect and earmarked stocks prescribed by the order will be maintained by allocation. Future requirements for top military uses also may be met by allocation, but all others must bear preference ratings.

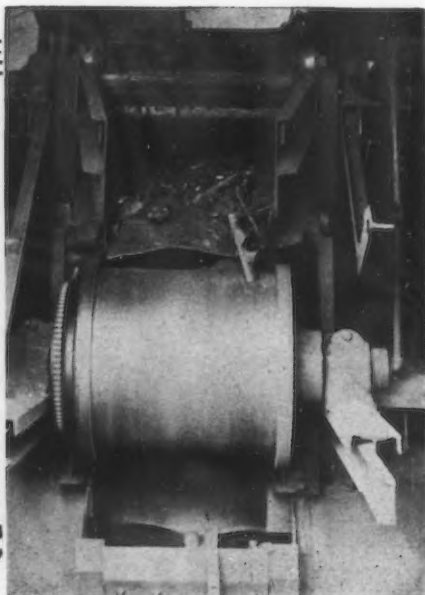
At the same time, manufacturers of steel drums and five-gallon kits were requested to furnish the Containers Branch of WPB with additional information on products shipped in such containers and the end use of the products. This information, necessary for the determination of the proper preference ratings to be issued to manufacturers, is to be provided on forms which should accompany PD-1-a applications for steel for the drums.

These forms can be obtained from the Priority Specialist, Containers Branch, WPB, Washington, D. C.

The forms request the following information: (1) Products manufactured and end use of such products. This should be explained in the greatest possible detail; (2) inventory of drums and kits on date of application; (3) reasons why substitute containers cannot be used; (4) percentage intended for export and for whose account.

The PD-1a form at present does

## A Difficult SAND RECLAIMING Job Licked by *Stearns* MAGNETIC



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## How to Handle Frozen Delivery Dates

••• How steel mills and other metal working plants should handle the shipment of material with protected delivery dates carrying preference ratings assigned by priority orders P-19a, b and c, was explained last week by C. E. Adams, chief of the iron and steel branch of WPB. Apparently some confusion has arisen over the scheduling of an order with a protected delivery date and carrying, for example, an A-1-b rating, as against another order with a protected delivery date and carrying a rating of A-1-a.

Mr. Adams, citing the wording of orders P-19a, b and c, said that it means that once the supplier has accepted the order and delivery dates have been fixed, it is mandatory upon the supplier to meet the delivery dates so fixed. These delivery dates may not thereafter be altered to permit delivery under higher rated orders subsequently received. As to any product under allocation (such as steel plates) deliveries with protected dates once arranged, must be so scheduled. It should be noted on the production schedule submitted to the iron and steel branch that the delivery date for this specific order is so frozen. The iron and steel branch will then include the delivery in the current production schedule.

These instructions are applicable to all contractors and subcontractors having contracts with suppliers who are covered by order P-19a, b and c.

not require all of this information. However, WPB said, if space allows these questions may be answered on the PD-1a without submitting a separate form.



## Alloy Steel Forms

••• WPB is reported experimenting with new types of alloy steel allocation forms, identified as PD-391 and PD-391-a. These forms are aimed at achieving a unified allocation of alloys by heat analyses. No order covering these forms has been issued yet, but the forms are in the hands of the principal users and if the plan operates successfully, a formal order

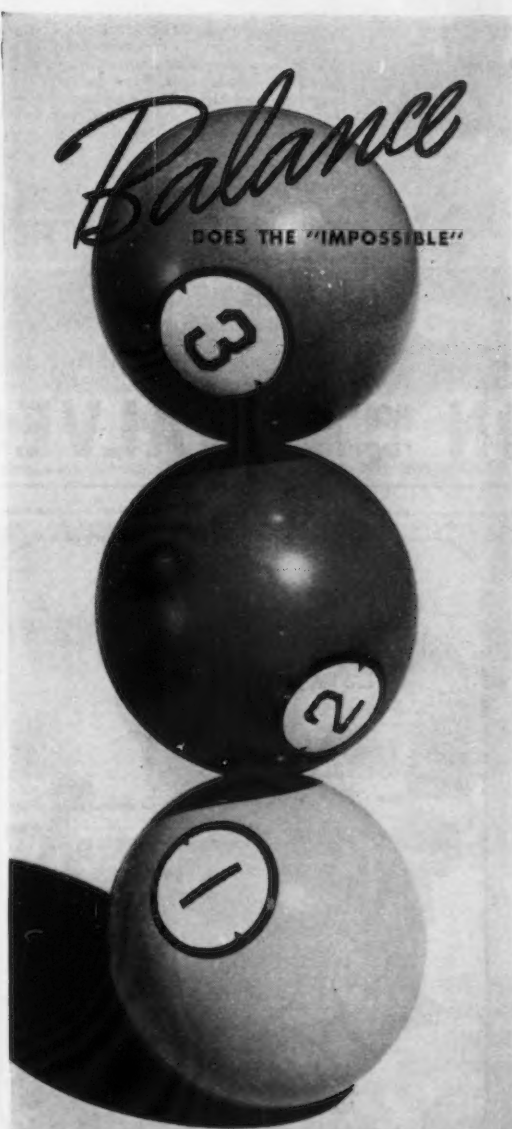
will be issued. The forms require, in addition to a breakdown of needs by analyses, a breakdown of consumption channels by means of the "end use code." WPB is expected to control analyses if customers do not submit specifications or if specifications call for too much critical material. The Iron and Steel Branch will expect consumers to get their applica-

tions in some 45 to 50 days before the material is needed.



## Office Furniture

••• WPB has ordered a complete halt, effective May 31, in production of all but four types of metal office equipment. Meanwhile sharp restrictions on output have been



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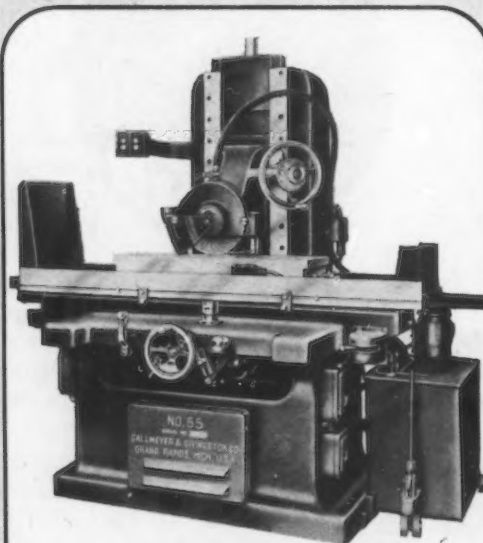
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## PRIORITIES

put into effect for all items. The four groups which may continue production but on a curtailed basis are insulated metal filing cabinets, safes, visible record equipment and metal shelving. For all other types WPB will not permit after the effective date, any manufacture, assembly, processing or fabrication. Instead, this capacity of the \$100,000,000 metal office equipment industry will be converted to war production. The industry is already partly converted and has produced sub-assembly airplane wings, demolition, incendiary and practice bombs.



### Farm Equipment

• • • Approximately 25,000 tons more of materials, mostly iron and steel, have been made available for farm machinery manufacture during the year ended Oct. 31, it was announced by WPB on April 1, in amendment No. 1 to orders L-26 and P-95. The increase in estimated material requirements as the result of revision of the program is brought about as follows:

In addition to increasing material requirements for essential machinery, the amendments make several technical changes in the original program. Chief change is the setting up of an alternate production percentage schedule, fixing percentages for entire groups of products rather than for individual items so that manufacturers can concentrate on those products for which they have greater demand, provided the overall tonnage is not exceeded.

Manufacturers may use the new schedule or continue operations under the existing schedule, which set up percentages for individual products, but they must notify WPB immediately if they intend to change. Once a choice is made, it was pointed out, they cannot shift back and forth between the two schedules.



### Railroad Equipment

• • • Preliminary to ordering concentration of production and distribution of all railroad construction, WPB last Saturday froze all finished locomotives, freight and passenger cars in the hands of producers. The orders prohibit produc-

## PRIORITIES

tion or delivery except in accordance with schedules to be issued this week, and without regard to preference ratings. The freight railroad car freeze orders L-97 and L-97-a do not in any way affect the program announced by SPAB at the beginning of last year.



### High Pressure Fittings

• • • Hydraulic or high pressure pipes, cast or forged steel fittings, and brazed or soldered brass or bronze fittings, whether screwed or flanged at any outlet, are excluded from the definition of pipe fittings in Schedule II of order L-42, WPB has announced. These fittings are required in shipbuilding and this is the reason for the amendment to the plumbing and heating simplification order, WPB said.



### Production Requirements Plan Procedure Changed

• • • Two modifications in the use of preference ratings under the Production Requirements Plan have been announced by WPB. Both are intended to simplify procedure and reduce the amount of clerical work involved.

In cases where a rating assigned under PRP is subsequently raised to a higher rating after appeal to the Production Requirements Branch, the applicant may notify his suppliers of the higher rating by letter instead of making out completely new purchase orders.

Another change in the application of PRP preference ratings permits a producer to make out a single order covering his requirements for the same material or product, even though he uses two or more different preference ratings which have been assigned to him. For example, if a producer has been assigned ratings of 25 per cent A-1-a, 25 per cent A-1-j, and 50 per cent A-2, on 1000 electric motors, he may make out a single purchase order as follows:

250 motors—rating A-1-a  
250 motors—rating A-1-j  
500 motors—rating A-2

#### TOTAL 1000

This eliminates the necessity for making out separate purchase orders for each rating used. However, the purchase order must be

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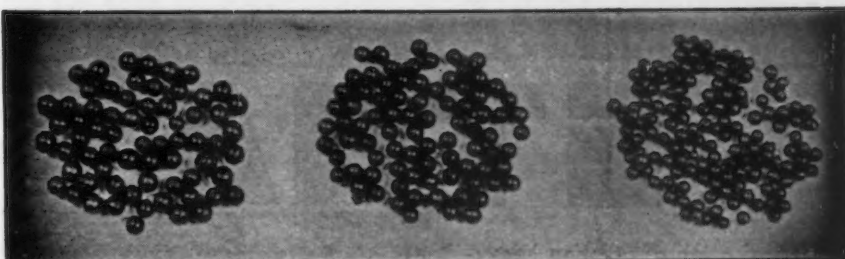
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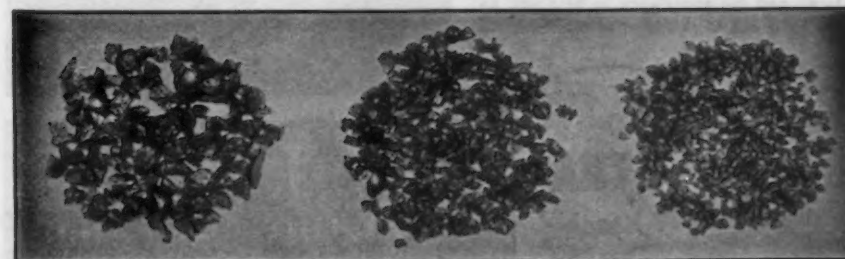
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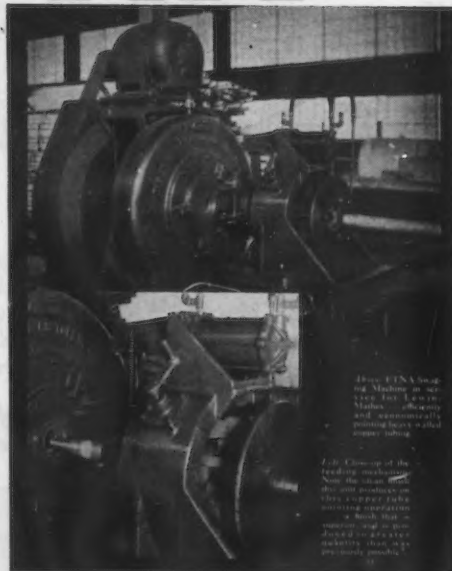
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They had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so Lewin-Mathes did the safe and logical thing—they put their swaging job up to Etna.

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Etna has the swaging machines from 3/8" to 4" and the experience to help you get the most out of this type of machine.



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**"Ask ETNA  
About Swaging"**

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MACHINE COMPANY  
TOLEDO OHIO

## PRIORITIES

made out in terms of the specific quantities to which the rating is assigned, and should not be made out with percentage figures. When several ratings are used on a single purchase order, an appropriate change must be made in the wording of the purchaser's endorsement.



### Jewelry Makers

••• The jewelry industry has been granted permission until May 15 to use up such of its copper in inventory as has been plated or alloyed with gold or silver. The permission was granted by WPB in order M-9-c-2.

The order provides that until May 15, manufacturers of jewelry may finish processing "contaminated inventory" consisting of copper which is plated or alloyed with gold or silver, but none other. Manufacturers of jewelry who have a larger inventory of this type than they will be able to process prior to May 16 may sell it to other manufacturers.

### Electric Steel Plant in Oregon Reported Approved

••• RFC has approved financing of the Portland area plant of Oregon Electric Steel Rolling Mills, Inc. One electric furnace with 35,000 tons annual capacity and a rolling mill for reinforcing and light shapes will compromise the initial unit to be in operation in October. The addition of a second furnace is planned later in accordance with the Hauck report outline. The furnace will be entirely dependent on purchased scrap but the owners have long been active in the scrap trade. They are negotiating with Bonneville for 7500 to 10,000 kilowatts. Morris Schnitzer is president.

Ohio Ferroalloys Corp. received WPB authorization to construct a large ferrosilicon plant in North Central Washington, east of the Cascade Mountains. The firm also has a plant at Tacoma. The new plant will be built by the Defense Plant Corp. and operated by the firm. Three electric furnaces will use power from the Bonneville-Coulee Grid. Centrally located to raw materials, it is expected to furnish large quantities of ferrosilicon for the magnesium plant which Reynolds Metals Corp. will build and operate in the Spokane area.

## This Week's Priorities and Prices

Priority compliance branch of WPB reports of investigations of 3500 firms. (WPB-794)

Railroad locomotives and freight and passenger cars frozen in producers' hands by orders L-97 and L-97-a issued April 4. (WPB-804)

Electrical appliance prices frozen by temporary price regulation No. 18 at levels of March 30. Order is effective April 7. (OPA-PM2859)

Plumbing fixture prices frozen at March 30 levels by temporary regulation No. 17, effective April 7. (OPA-PM2860)

Typewriter makers permitted to produce certain parts and sub-assemblies in excess of quotas, according to interpretation of order L-54-a. (WPB-791)

Plumbing fixture simplification schedule No. II of order L-42 amended to exempt certain fittings used in shipbuilding. (WPB-795)

Copper used for civilian purposes to be subjected to further curbs due to increased arms output. (WPB-771). Copper scrap order M-9-b extended indefinitely. (WPB-759)

Steel drum makers heretofore obtaining sheet steel by allocations will have to depend upon preference ratings alone, beginning June 1. (WPB-776)

Tin and terneplate use for closures for glass containers restricted by order M-104 issued April 3. (WPB-778)

Shipbuilding order P-7 interpretation issued April 3 specifies material which can be obtained with assigned preference ratings. (WPB-781)

Rubber order M-15-1-b amended to permit manufacture of passenger car tire capping stock entirely from reclaimed rubber. (WPB-793)

Warehouse steel price schedule No. 49 revised March 31 to eliminate hardship caused by higher costs in some items. (OPA-PM2839)

Southern pine lumber industry advisory committee formed. (OPA-PM2849)

Truck makers permitted to use fabricated or semi-fabricated materials to produce trucks for Army, Navy and certain export needs by amendments to orders L-1-a, and P-54.

Steel and iron scrap prices will not be raised, OPA reiterates. (WPB-766)

Office machinery industry advisory committee formed.

(WPB-786). Future production to be confined to needs of specified government agencies. (WPB-788). Metal office furniture and equipment production to halt May 31, according to order L-13-a, issued April 2. (WPB-769)

Chemical firm ordered to refrain from selling specified chemicals due to alleged diversion of material obtained under a priority rating. (WPB-775)

Fluorescent fixture making banned, except for war uses, by order L-78, issued April 2. (WPB-777)

Bicycle sale, shipment, delivery or transfer frozen, effective 11:59 p. m. April 2, by order L-52-a. (WPB-779)

Pennsylvania anthracite coal price schedule No. 112 explained. (OPA-PM2829)

Fuel oil prices on Eastern Seaboard will not be increased at this time. (OPA-PM2843)

Oxalic acid of the reagent grade exempted from price schedule No. 78. (OPA-PM2844)

Farm equipment production program under orders P-95 and L-26 revised upward. (WPB-707)

Collapsible tin tube use placed under rigid restriction in order M-115. (WPB-747)

Sanitary cast iron and formed enamelware subcommittee of plumbing and heating industry advisory committee is formed. (WPB-748)

Machine tool order P-77 extended to May 1; shift to PRP expected. (WPB-753)

Antimonial lead price raised by amendment to schedule No. 70. (OPA-T183)

Cast iron soil pipe and fitting prices under schedule No. 100 revised with respect to emergency shipments of less than 250 lb. (OPA-T184)

Vacuum cleaner production to halt on April 30, according to order L-18-b. (WPB-733)

Steel use in non-mechanical refrigerators to be reduced, according to order L-7-b. (WPB-737). Steel use in a large number of household articles curtailed by order L-30. (WPB-741)

• • •

*For copies of above announcements address Division of Information, WPB (or OPA), Washington, giving announcement number as shown in parentheses after each paragraph. (For example, WPB:600 means announcement 600 issued by the War Production Board.)*

## Revisions for The Iron Age Priorities Guide

• • • The following data should be added to THE IRON AGE Priorities Guide published with the issue of March 26 to bring the Guide up to date.

Under "P Orders," page 5, add:

- P-7... Interpretation No. 1 (4-3-42) defines material which can be assigned ratings.
- P-77... Extension (3-31-42) Order extended to May 1; users advised to shift to PRP.
- P-94... Material for production of printing ink assigned rating of A-5 (3-30-42). Related form: PD-345. See also M-53.
- P-95... Amendment (3-30-42) increases aid given farm equipment makers.

Under "M Orders," page 9, add:

- M-6-a... Amended 3-30-42. Nickel redefined for broader coverage; other minor changes.
- M-15-b... Amendment No. 7 (3-30-42) sets up further restrictions on use of crude rubber and latex.
- M-19... Amendment No. 2 (3-30-42) postpones effective date to May 1.
- M-53... Restricts use of certain materials used in making printing inks (3-30-42). Form for appeal: PD-344.
- M-58... Glycerine deliveries in excess of 50 lb. per month placed under full allocation, effective May 1 (3-30-42). Related forms: PD-361, 362, 363.
- M-104... Restricts use of tin and terneplate for closures for glass containers (4-3-42).
- M-112... Antimony placed under full allocation, effective May 1 (3-30-42). Related forms: PD-380, 381.

- M-115... Regulates use of collapsible tin tubes (4-1-42).
- M-123... Limits deliveries of asbestos textiles except for industrial packings or orders rated A-10 or higher (3-30-42).

Under "L Orders," page 12, add:

- L-5-c... Amendment No. 3 (3-28-42) excludes kerosene refrigerators from restrictions of order.
- L-7-b... Further reduces use of steel in non-mechanical refrigerators (3-30-42).
- L-13-a... Curtails production of metal office equipment (4-1-42).
- L-18-b... Orders cessation of vacuum cleaner production after April 30 (3-30-42).
- L-30... Curtails iron, steel and zinc use in various kitchen and household articles (3-31-42).
- L-42... Amendment No. 1 to Schedule II (4-4-42) exempts certain types of pipe fittings used in shipbuilding.
- L-52-a... Freezes sale, delivery of new adult bicycles effective 11:59 P.M. April 2 (4-2-42).
- L-64... Restricts use of metals in caskets, burial vaults (3-28-42).
- L-67... Restricts use of metal in lawn mowers (3-30-42).
- L-68... Restricts metal use slide fasteners, other closures (3-18-42).
- L-78... Restricts production of fluorescent lighting fixtures (4-2-42).
- L-81... Restricts production of metal and plastic, other type toys (3-30-42).



# Plate Production Sets Record in February

...Despite the shorter month, in February the production of steel plate for sale was 734,656 net tons, a new high record, compared with 713,182 tons in January and 417,637 tons in February, 1941, according to the American Iron and Steel Institute.

The gain in plate production resulted partly from changes made in large continuous strip mills en-

abling them to roll the heavier product.

In February, production of sheets and strip totaled 995,414 net tons compared with 1,343,266 tons one year before, a decline of nearly 26 per cent. In January this year the output of sheets and strip totaled 1,162,304 tons.

In numerous instances, mills that formerly rolled sheet and

strip steel for automobiles, refrigerators and other peacetime products are now rolling the plate.

One feature of February was the sharp rise in black plate which has a rated capacity of 342,100 net tons a year. February output was 57,114 net tons or 217.6 per cent. For the two months the total was 107,583 net tons or 194½ per cent. In January 50,479 tons were produced.

AMERICAN IRON AND STEEL INSTITUTE											
Capacity and Production for Sale of Iron and Steel Products											
February - 1942											
	Number of companies	Items	Annual Capacity, Net tons (a)	PRODUCTION FOR SALE—NET TONS							
				Current Month				Year to Date			
				Total	Per cent of capacity	Export *	To members of the industry for conversion into further finished products	Total	Per Cent of capacity	Export *	To members of the industry for conversion into further finished products
Ingot, blooms, billets, slabs, sheet bars, etc.	43	1	xxxxxx	589,817	xxx		162,301	1,189,161	xxx		334,188
Heavy structural shapes	9	2	5,055,580	354,283	91.3		xxxxxx	751,857	92.7		xxxxxx
Steel piling	4	3	374,000	32,221	112.3		xxxxxx	70,319	116.3		xxxxxx
Plates—Sheared and Universal	20	4	7,101,320	734,656	134.8		9,079	1,447,763	126.1		22,459
Skelp	7	5	xxxxxx	69,195	xxx		34,347	152,475	xxx		87,952
Rails—Standard (over 60 lbs.)	4	6	3,509,260	107,639	40.0		xxxxxx	230,901	40.7		xxxxxx
Light (60 lbs. and under)	6	7	309,690	13,221	55.6		xxxxxx	21,240	42.4		xxxxxx
All other (incl. girder, guard, etc.)	2	8	102,000	1,313	16.8		xxxxxx	2,673	16.2		xxxxxx
Splice bar and tie plates	12	9	1,108,270	43,282	50.9		xxxxxx	97,338	54.3		xxxxxx
Bars—Merchant	42	10	xxxxxx	545,352	xxx		60,028	1,140,089	xxx		141,846
Concrete reinforcing—New billet	18	11	xxxxxx	138,600	xxx		xxxxxx	301,088	xxx		xxxxxx
Revolving	17	12	xxxxxx	13,693	xxx		xxxxxx	32,553	xxx		xxxxxx
Cold finished—Carbon	23	13	xxxxxx	98,286	xxx		xxxxxx	209,831	xxx		xxxxxx
Alloy—Hot rolled	17	14	xxxxxx	148,992	xxx		25,276	296,806	xxx		56,622
Cold finished	16	15	xxxxxx	17,369	xxx		xxxxxx	35,959	xxx		xxxxxx
Hoops and baling bands	4	16	xxxxxx	7,270	xxx		xxxxxx	13,406	xxx		xxxxxx
TOTAL BARS	64	17	13,680,180	969,572	92.4		85,304	2,029,712	91.8		198,468
Tool steel bars (rolled and forged)	15	18	188,820	12,802	88.4		xxxxxx	25,316	82.9		xxxxxx
Pipe and tube—B. W.	16	19	2,227,040	133,785	78.3		xxxxxx	271,531	75.4		xxxxxx
L. W.	8	20	904,400	35,684	51.4		xxxxxx	77,398	52.9		xxxxxx
Electric weld	7	21	1,165,450	42,929	48.0		xxxxxx	99,260	52.7		xxxxxx
Seamless	14	22	3,031,160	164,052	70.5		xxxxxx	326,617	66.6		xxxxxx
Conduit	8	23	186,280	11,876	83.1		xxxxxx	26,668	88.5		xxxxxx
Mechanical Tubing	10	24	402,600	30,421	98.5		xxxxxx	63,579	97.7		xxxxxx
Wire rods	21	25	xxxxxx	98,954	xxx		13,581	211,818	xxx		31,171
Wire—Drawn	42	26	2,338,090	159,726	89.0		2,516	360,438	95.3		6,174
Nails and staples	19	27	1,152,170	58,391	66.1		xxxxxx	119,869	64.3		xxxxxx
Barbed and twisted	15	28	461,270	24,415	69.0		xxxxxx	51,081	68.5		xxxxxx
Woven wire fence	16	29	766,485	17,398	29.6		xxxxxx	37,498	30.3		xxxxxx
Bale ties	11	30	114,910	6,335	71.9		xxxxxx	11,815	63.6		xxxxxx
All other wire products	9	31	71,020	3,223	59.1		xxxxxx	6,326	55.1		xxxxxx
Fence posts	12	32	120,185	3,896	42.3		xxxxxx	7,638	39.3		xxxxxx
Black plate	11	33	342,100	57,114	217.6			107,583	194.5		
Tin plate—Hot rolled	6	34	508,620	36,148	92.6		xxxxxx	73,496	89.4		xxxxxx
Cold reduced	11	35	3,871,340	224,679	75.6		xxxxxx	504,520	80.6		xxxxxx
Sheets—Hot rolled	28	36	xxxxxx	470,710	xxx		13,662	1,022,453	xxx		34,663
Galvanized	15	37	xxxxxx	102,771	xxx		xxxxxx	214,100	xxx		xxxxxx
Cold rolled	16	38	xxxxxx	157,836	xxx		xxxxxx	359,009	xxx		xxxxxx
All other	13	39	xxxxxx	46,985	xxx		xxxxxx	94,851	xxx		xxxxxx
TOTAL SHEETS	30	40	13,098,250	778,302	77.5		13,662	1,690,413	79.8		34,663
Strip—Hot rolled	25	41	2,924,340	134,145	59.8		14,733	286,473	60.6		31,489
Cold rolled	40	42	1,605,840	82,967	67.3		xxxxxx	183,327	70.6		xxxxxx
Wheels (car, rolled steel)	5	43	424,820	22,667	69.5		xxxxxx	44,068	64.2		xxxxxx
Axles	6	44	453,470	19,207	55.2		xxxxxx	39,468	53.8		xxxxxx
Track spikes	11	45	320,450	11,226	45.7		xxxxxx	25,948	50.1		xxxxxx
All other	7	46	91,600	11,811	168.1		xxxxxx	21,432	144.7		xxxxxx
TOTAL STEEL PRODUCTS	167	47	xxxxxx	5,097,353	xxx		335,523	10,673,019	xxx		746,564
Pig iron, ferro manganese and spiegel	29	48	xxxxxx	653,999	xxx		234,406	1,385,891	xxx		520,447
Ingot moulds	5	49	xxxxxx	68,426	xxx		xxxxxx	134,107	xxx		xxxxxx
Bars	12	50	177,115	9,061	66.7		989	19,186	67.0		1,796
Pipe and tubes	3	51	109,300	6,688	79.8		xxxxxx	14,277	80.8		xxxxxx
All other	1	52	56,000	1,695	39.5			3,650	40.3		
TOTAL IRON PRODUCTS (ITEMS 50 to 52)	14	53	277,915	17,444	81.8		989	37,113	82.6		1,796

Total number of companies included, 195.

(a) To be revised.

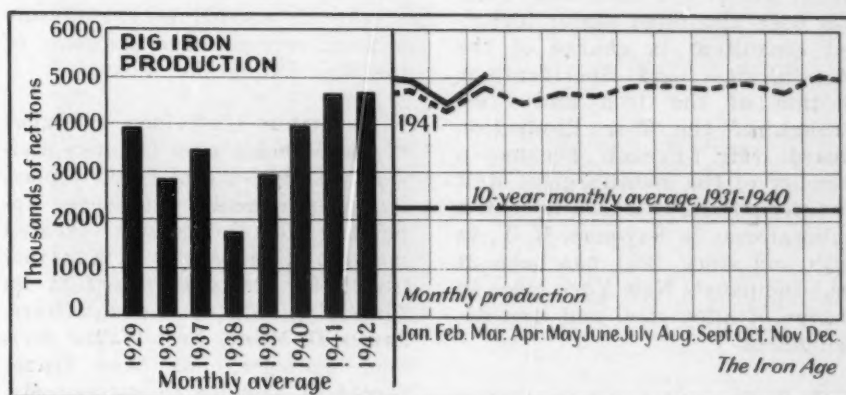
During 1940 the companies included above represented 98.0% of the total output of finished rolled products.

\* In accordance with Government policy, export figures cannot be published.

## Pig Iron Output at New High in March

••• Production of coke pig iron reached a new high in March, amounting to 5,113,187 net tons (partly estimated), compared to 4,502,273, the revised total for February. On a daily basis, production in March increased about 2 per cent over that in February, or from 160,795 tons a day the previous month to 164,941 tons a day in March. The operating rate for the industry last month was 99.9 per cent of capacity, compared to 97.4 per cent in February.

There were 220 furnaces in blast on April 1 producing at the rate of 164,675 net tons a day, compared to the same number on March 1, making 160,795 tons.



Production by Districts and Coke Furnaces in Blast (In Net Tons)

	March, 1942		February, 1942		March, 1941	April 1, 1942		March 1, 1942	
		Daily % of Capacity		Daily % of Capacity		No. in Blast	Operating Rate	No. in Blast	Operating Rate
Eastern .....	39,153	112.1	32,910	110.6	38,862	2	1,265	2	1,245
Buffalo .....	325,648	99.0	288,013	97.0	269,335	14	10,505	14	10,285
Philadelphia .....	478,088	100.7	434,024	101.3	402,094	19	15,420	19	15,500
Ferro. and Spiegel .....	18,631	105.8	17,132	107.9	18,831	4	600	4	610
Pittsburgh .....	1,191,025	98.5	1,041,478	95.4	1,134,173	49	38,970	49	37,195
Ferro. and Spiegel .....	34,919	70.4	26,739	59.8	34,367	4	1,125	3	955
South Ohio River .....	106,104	97.4	89,973	91.4	102,071	6	3,235	7	3,295
Valleys .....	616,424	105.3	553,082	104.6	557,946	25	19,885	25	19,755
Wheeling .....	238,120	102.3	216,493*	103.0*	218,750	10	7,680	10	7,730*
Cleveland .....	390,106	95.7	337,306	96.9	418,684	15	12,585	15	12,755
Chicago .....	1,065,826	101.2	952,913	100.1	.....	39	34,510	39	34,035
Ferro. and Spiegel .....	8,553	.....	7,152	.....	1,002,502	1	275	1	255
St. Louis .....	24,065	68.9	23,138	73.5	.....	1	775	1	825
Detroit .....	142,102	111.1	131,273	107.3	115,955	5	4,585	5	4,690
Western .....	75,424	91.8	53,939	72.7	67,793	4	2,435	4	2,195
Southern .....	326,907	94.6	296,917	95.1	320,510	18	10,545	18	10,605
Ferromanganese .....	9,844	90.1	9,791	101.7	2,262	4	320	4	360
Total .....	5,113,187	99.9	4,502,273*	97.4*	4,704,135	220	164,675	220	162,285*

\*Revised.

Production of Coke Pig Iron and Ferromanganese

	Pig Iron*		Ferro-Mn†	
	1942	1941	1942	1941
January .....	4,970,531	4,663,695	36,455	35,337
February .....	4,502,273	4,197,872	42,832	33,627
March .....	5,113,187	4,704,135	51,775	37,808
April .....	.....	4,334,267	.....	44,341
May .....	.....	4,599,966	.....	47,256
June .....	.....	4,553,165	.....	42,582
½ year .....	27,053,100	.....	240,951	.....
July .....	.....	4,770,778	.....	47,193
August .....	.....	4,791,432	.....	52,735
September .....	.....	4,716,901	.....	46,932
October .....	.....	4,856,306	.....	55,495
November .....	.....	4,702,927	.....	47,669
December .....	.....	5,012,276	.....	48,188
Year .....	55,903,720	.....	539,163	.....

\*These totals do not include charcoal pig iron. †Included in pig iron figures.

Daily Average Production of Coke Pig Iron

	Per Cent		Per Cent	
	1942	Capacity	1941	Capacity
January .....	160,340	97.7	150,441	95.5
February .....	160,795	97.4	149,924	95.2
March .....	164,941	99.9	151,745	96.9
April .....	.....	.....	144,475	91.8
May .....	.....	.....	148,386	93.8
June .....	.....	.....	151,772	95.9
½ year .....	.....	.....	149,465	94.5
July .....	.....	.....	153,896	97.1
August .....	.....	.....	154,562	97.5
September .....	.....	.....	157,230	98.8
October .....	.....	.....	156,655	98.2
November .....	.....	.....	156,764	97.7
December .....	.....	.....	161,686	101.2
Year .....	.....	.....	153,161	96.6

Merchant Iron Made, Daily Rate

	1942	1941	1940
January .....	20,085	20,312	16,475
February .....	22,502	21,254	14,773
March .....	21,790	23,069	11,760
April .....	.....	20,434	13,656
May .....	.....	21,235	16,521
June .....	.....	21,933	13,662
July .....	.....	21,957	16,619
August .....	.....	22,578	17,395
September .....	.....	21,803	17,571
October .....	.....	23,243	18,694
November .....	.....	22,690	22,792
December .....	.....	23,567	19,779



# PERSONALS . . .

• **H. J. French**, metallurgist, in charge of alloy steel and iron development in the development and research division of the International Nickel Co., Inc., New York, has been appointed senior technical consultant in charge of the Metallurgical and Specifications Section of the Iron and Steel Branch of the War Production Board. Mr. French became a member of the metallurgical staff of International Nickel's Research Laboratories in Bayonne, N. J., in 1929 and since 1931 has been at that company's New York office in charge of alloy steel and iron development.

• **H. C. Clement** has been named assistant to the New York district manager of the General Electric Co., Schenectady, N. Y. Mr. Clement joined G.E. in 1910 when he was employed by the lighting sales division as a salesman in the New York District. In 1923 he was designated representative in the sales division of the central station department at which post he remained until his present appointment.

• **R. G. Forsberg** has been appointed purchasing agent of the Jessop Steel Co., Washington, Pa. He succeeds **R. J. Murray**, former purchasing agent, who is now secretary and assistant treasurer.

• **W. A. Cramer** has been appointed as assistant traffic manager, Western district, Chicago, for United States Steel Corp. subsidiaries. **D. M. Morewood** has been named assistant traffic manager, Eastern district, Pittsburgh, and **R. N. Shields**, general supervisor, traffic department, Eastern district, Pittsburgh.

• **Dean Cullen Smith**, director of commercial sales in St. Louis for the Curtiss-Wright Corp. since 1938, has been named head of a research staff set up at the company's Buffalo plant to develop new ideas in post war air travel and explore possibilities for air freight expansion. Mr. Smith has logged 16,000 flying miles since 1918 and was a pilot with the Byrd Antarctic Expedition from 1928 to 1930.

• **William D. Keefe**, sales manager in the refrigeration division of the Fedders Manufacturing Co., Inc., Buffalo, has been appointed a member of the advisory committee of the air conditioning and commercial refrigeration industry of the War Production Board.

• **G. Arthur Gustafson**, manager of the Meriden and Taunton divisions of the General Electric plastics department, has been appointed to the newly created position of supervisor of manufacturing for the department at its Pittsfield, Mass., headquarters. **James D. Milne**, Fort Wayne division manager, has been transferred to Meriden to succeed Mr. Gustafson, and **Clarence W. Coe** and **Everett W. Bickford** have been named division managers of the Fort Wayne and Taunton plants respectively.

• **C. H. Vom Baur** has left for abroad to make an examination and report for a foreign and friendly government on the further development of their iron and steel possibilities. Mr. Vom Baur was consultant to the Watertown Arsenal in the making of centrifugally cast cannon. He was also technical director to the U.S.S.R. electric furnace department and at one time manufactured electric furnaces.

• **John L. Young**, manager of machinery-sales of United Engineering & Foundry Co., Pittsburgh, has been placed in charge as project manager of a new division of the company formed for the construction of a complete aluminum sheet rolling mill plant in the West under a contract with the Defense Plant Corp., Washington. **William Hagel**, formerly assistant to the sales managers, has been promoted to assistant sales manager, and has assumed the sales department duties of Mr. Young during the period of construction of the aluminum plant. **B. D. McMillen, Jr.**, has been named project purchasing agent at Pittsburgh, and **G. C. Shutte**, project purchasing agent in the field. Other project engineers on this job are **K. C. Gardner, Jr.**, and **H. O. Shepard**.

• **Walter F. Munford** has been named manager of operations of

the Worcester, Mass., district of the American Steel & Wire Co., Pittsburgh. Mr. Munford has been associated with American Steel & Wire since 1919.

• **James W. Bancker**, director and vice-president of the Western Electric Co., New York, has retired under the Bell System age rule today, bringing to a formal close a career that for very nearly 50 years paralleled the growth of telephone communications in America. Mr. Bancker joined Western Electric in New York in 1892 as a \$3.50-a-week office boy. He retires from a post in which, during the past two years, he has directly supervised the company's war work, involving the execution of many millions of dollars in U. S. Government contracts. Mr. Bancker's responsibilities in the future will be divided among a number of executives.

• **S. L. Bates**, Ohio representative for the Wickwire Spencer Steel Co., New York, since 1936, has been appointed Buffalo district sales manager. Prior to joining Wickwire Spencer, Mr. Bates was secretary and assistant treasurer of the Beans Spring Co., Massillon, Ohio. He had previously served as purchasing agent of the National Pressed Steel Co.

• **Charles D. Cavett** has been appointed advertising and sales promotion manager of the Cummins Diesel Engine Corp. of New York.

• **Charles H. Morse**, son of the founder of Fairbanks, Morse & Co., Chicago, and former president and board chairman, has returned to the firm after an absence of three years to become a member of the board of directors. **Allen E. Ashcraft** and **Arthur C. Doge**, both vice-presidents, also were elected to the board.

• **H. C. Hunt** has been appointed manager claim bureau, metallurgical division, Pittsburgh district, for Carnegie-Illinois Steel Corp., succeeding **Lucian Jeffries** who retired March 31 after 45 years service with the company. Mr. Hunt has been with this company since 1906. From the time of his first employment to 1935 he had a varied experience in mill and general office positions, which resulted in his being appointed chief clerk of the claim bureau in 1936, which position he has held until his present appointment.

• **J. B. Colesworthy** has been appointed Los Angeles district sales representative of the Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., with headquarters at 1709 West 8th Street, Los Angeles. Mr. Colesworthy had been previously connected with the Los Angeles sales organization of the Westinghouse Electric & Mfg. Co.

• **Heywood Fox**, formerly an executive of the American Optical Co., has been elected a member of the board of directors of the Spencer Lens Co., Buffalo. **Ira Mosher**, vice-president and general manager of American Optical, has been elected chairman of the executive committee of Spencer Lens.

• **Samuel A. Trott**, is president of a newly organized firm engaged in tool, die, jig and fixture design and product engineering under the name Trott Engineering Co., 3631 McClellan Ave., Detroit. Mr. Trott had formerly been with Bower Roller Bearing Co., Detroit for 12 years and with Willey Carbide Tool Co. for one year. **Frank E. Dow**, construction engineer, is a partner in the firm.

• **Ralph H. McQuat**, former vice-president, Pump Engineering Service Corp., has been elected president of Romec Pump Co., Elyria, Ohio. **Carl F. Shuler** was elected secretary-treasurer.

• **Alan J. Pickering** has been elected assistant treasurer of Republic Aviation Corp., Farmingdale, N. Y. Mr. Pickering has served as an assistant to the treasurer since he came to the company in September, 1940, after eight years in the financial department of the Air Corps. Mr. Pickering's association with aircraft began in 1917 when he joined the U. S. Signal Corps. For several years he was directly connected with the office of the Secretary of War.

• **J. T. Baral, Jr.**, has been appointed advertising supervisor for the foundries divisions of the Baldwin Locomotive Works, Philadelphia. Mr. Baral formerly was advertising manager for the Roberts & Mander Stove Co., Philadelphia, and the R. M. Hollingshead Corp., Camden, N. J.



**WALTER H. FRIEDLINE**, manager of sales, Lorain division products, Carnegie-Illinois Steel Corp.

• **Walter H. Friedline** has been made manager of sales, Lorain division products, Carnegie-Illinois Steel Corp., Pittsburgh. This appointment is incident to the leave of absence given Mr. Carroll Burton, vice-president and manager of sales, Lorain division, to join the War Production Board in Washington. Mr. Friedline entered the employ of the Lorain Steel Co. in 1907. In 1937 he became chief of the estimating department and in 1938 was made assistant manager of sales, Johnstown products, of the Lorain division.

• **Horace J. Grover** has been named a research physicist on the staff of Battelle Memorial Institute, Columbus, Ohio. He has been assigned to research in industrial physics.

• **John W. B. Foringer** has been appointed director of industrial relations, **George B. McConnell**, manager of operations, **A. R. Maronde**, manager of engineering department, and **John F. Bassel** as supervisor of accounting, for Scully Steel Products Co. Mr. Foringer goes to Scully from the industrial relations staff of Carnegie-Illinois Steel Corp. He began at Gary works of Carnegie-Illinois in 1940 as assistant to superintendent, industrial relations, and served there for a year until he was transferred to Pittsburgh to the staff of the

vice-president of industrial relations where he remained until the present time. Mr. McConnell was first employed in the order department of the old Scully Steel & Iron Co., in 1923. In 1927, he was made manager of the engineering department, the post he has held until this time. Mr. Maronde joined the Scully Steel Products Co. in 1935. He was appointed assistant to the manager of the engineering department in 1939.

• **Russell B. Barnett**, former Buffalo branch manager of Peter A. Frasse & Co., Inc., New York, has been appointed to the same capacity in the company's Philadelphia branch. Mr. Barnett, previous to his Frasse connection, was assistant sales manager of the Union Drawn Steel division, Republic Steel Corp. Succeeding Mr. Barnett as Buffalo branch manager is **Leslie N. Stetson**, former Frasse sales representative in the Buffalo area.

• **Henry W. Ruesch** has recently been appointed a vice-president of Phoenix Mfg. Co., Joliet, Ill., and Catasauqua, Pa. Mr. Ruesch has been associated with Phoenix for the past 33 years, and before his recent appointment served as assistant treasurer and office manager for the company.

• **D. M. MacNeil** has been appointed district sales manager, Wheeling Steel Corp., in New England, succeeding H. W. Reynolds, who has resigned. Mr. MacNeil has been with Wheeling Steel since 1925 and most recently as a salesman in New England.

• **Daniel C. Green** has been elected a director and named to the newly established position of chairman of the board of the Cleveland Pneumatic Tool Co., Cleveland. Mr. Green, a graduate electrical engineer from Purdue, has been head of the Central Service Corp., Chicago utilities specialists, and is a co-receiver of the Chicago Street Railway system.

• **Louis W. Wulfekuhler** has been elected secretary of Lockheed Aircraft Corp., Burbank, Cal., succeeding **Cyril Chappellet**, recently made a vice-president. Mr. Wulfekuhler has been associated with Lockheed for more than eight years having joined the company in 1934 as sheet metal stock clerk. He had held the position of assis-



tant secretary for several years. **Dudley E. Browne** has been elected comptroller, a new office.

- **John J. Fitzpatrick** has been elected a vice-president of the **Armstrong Cork Co.**, Lancaster, Pa. Mr. Fitzpatrick, who is general manager of Armstrong's munitions division, has been associated with the company since 1911. He went to Spain in 1914 where he supervised the erection of the company's corkboard insulation plant in Seville. He served as general manager of Armstrong's Spanish subsidiary for approximately 25 years and prior to his return to the United States in 1939, was its senior vice-president.

- **Osborne Bezanson**, general manager of the Texas division of **Mon-santo Chemical Co.**, St. Louis, was elected a vice-president of the company.

- **Allen E. Bailey, Jr.**, and **William D. Cockrell** have been appointed as manager of sales and engineer respectively of the newly organized electronic control section of the **General Electric Co.**, Schenectady. Mr. Bailey joined the General Electric Co. in 1916 and was first assigned to its drafting department at Schenectady. In 1929, after a short period as sales engineer in G-E's switchgear department, he transferred to the company's industrial department at Schenectady. Since that time Mr. Bailey has been affiliated with the development of industrial applications of vacuum tubes. Mr. Cockrell joined the General Electric Co. as a student engineer, being transferred in 1930 to the radio engineering department and later to the industrial control engineering department.

- **William C. Hughes** has been elected president of **Julius Blum & Co., Inc.**, New York, to succeed **Julius Blum**, who died recently. The board of directors also elected **William Thurnauer**, assistant treasurer, as treasurer.

- **Robert H. McCracken**, Philadelphia district sales manager of the **Central Iron & Steel Co.**, Harrisburg, Pa., since 1926, has been appointed assistant general sales manager with offices in Harrisburg. In a reorganization of its sales department, the company has transferred its district sales man-

agers to the general sales office in Harrisburg. These include **W. R. Baker**, from New York, **P. J. Driscoll**, Philadelphia, **E. S. Webster**, Baltimore and **W. H. Spooner**, Boston.

- **George W. Mason**, president of **Nash-Kelvinator Corp.**, Kenosha, Wis., was elected a director of the **Square D Co.**, Detroit and Milwaukee.

- **Robert S. Maddocks**, district sales manager in New York for the **Central Iron & Steel Co.**, Harrisburg, Pa., has resigned his position with that company to become associated with **Paterson Boiler & Tank, Inc.**, steel plate fabricator of Paterson, N. J.

- **R. L. Kirkpatrick** has been appointed manager, renewal parts section, of the **Westinghouse Electric & Mfg. Co.**, East Pittsburgh. Mr. Kirkpatrick joined the company in 1922 when he was 16 years of age. Entering Westinghouse Technical Night School immediately, he studied engineering three nights a week for four years and received his engineering certificate in 1926.

- **S. N. F. Hedman** has been appointed designing engineer of the mechanical drive section of the turbine engineering department of **General Electric's River Works**. Mr. Hedman succeeds **R. G. Stand-erwick** who is relinquishing his position as designing engineer of the mechanical drive section, turbine engineering department, to devote all of his time to another department.

- **John S. Richards** has been appointed director of research, **American Steel & Wire Co.**, subsidiary of the **United States Steel Corp.**, Cleveland, and will be succeeded as manager of the metallurgical department by **James R. Thompson**. **Flint C. Elder**, whom Mr. Richards succeeds, has been named research engineer—special assignments for the vice-president. **Lawrence H. Dunham** has been made assistant manager of the metallurgical department to succeed Mr. Thompson.

- **David P. Calhoun, Jr.**, St. Louis, has recently assumed his duties as president of the **Trailer Co. of America**. He fills the vacancy created by the resignation of **A. J. Waltering**.

## OBITUARY . . .

- **Milton J. Carpenter**, president of **Carpenter Brothers, Inc.**, Milwaukee, foundry sand and supplies firm, died March 18. He was 50 years of age. Mr. Carpenter and his brother, **Everett N.**, organized the present firm in 1917, and soon after, he enlisted in the army during the first World War, was a lieutenant in an infantry division serving in Archangel.

- **Frank M. Harbison**, secretary-treasurer of **Jones & Laughlin Steel Corp.**, Pittsburgh, died suddenly March 24 in Los Angeles, aged 55 years.

- **August C. Ullrich, Sr.**, superintendent of **Gould & Eberhardt, Inc.**, Newark, died March 27 after an operation. Last year, Mr. Ullrich celebrated his 50th anniversary with the company.

- **Harry G. Steele**, president of **U. S. Electrical Motors, Inc.**, Los Angeles, died at his home in Pasadena, Cal., April 2. He was head of the motor concern for the past 22 years, with plants in Los Angeles and Milford, Conn. He was 60 years old.

- **S. Alva Moog**, treasurer of the **St. Louis Spring Co.**, St. Louis, and the **Moog Piston Ring Co.**, died March 18.

- **G. Russell Goff**, treasurer of the **Draper Corp.**, Hopedale, Mass., died March 14.

- **Harry Davis**, superintendent of magnesium activities of **Permanente Metals Corp.**, was killed in an automobile accident near the Permanente plant at Los Altos, Cal., March 24.

- **Dr. Walter Lee Nicholls**, superintendent of health and chief surgeon for **Woodward Iron Co.**, Birmingham, from 1924 to 1936, died March 31 at his home in Birmingham, aged 65 years. A native of Alabama, Dr. Nicholls served for several years as a district surgeon for the **Tennessee Coal, Iron & Railroad Co.**, Birmingham, before becoming associated with Woodward.

- **George H. Wallace**, who, until his retirement two years ago, was an erecting engineer for the **Nordberg Mfg. Co.**, Milwaukee, died March 25 after a brief illness.

## Cleveland-Cliffs Reports All-Time Sales Peak in '41

### Cleveland

••• The Cleveland-Cliffs Iron Co. reported earnings of \$4,149,512, a decline in 1941 from the \$4,382,000 of 1940, largely due to increased operating costs and the low level of iron ore prices. The total sales established an all-time peak of \$40,692,347. The company's iron ore properties shipped 7,080,424 gross tons of ore, or 7.82 per cent of all the Lake Superior ore shipped in 1941. The company's mines operated at capacity during the entire year.

The company's fleet of 23 vessels moved 9,600,073 gross tons of ore and coal, which was 1,115,000 tons more than were handled the previous year.

## Mystic Iron Stocks Insure April and May Deliveries

### Boston

••• The customers of Mystic Iron Co., whose furnace was reported down this week for relining and repairs, will be taken care of during April and May from an accumulated stockpile of iron at the furnace. Under the direction of WPB, this stockpile was built up for the emergency of taking the furnace out of blast.

According to officials of the company, the furnace is scheduled to be down for six weeks, but work will be rushed in every manner possible. The iron stockpile will be rationed in the same manner as if the furnace were in production.

## Jisco to Build New Stack

### Jackson, Ohio

••• What was believed would be a relining and air conditioning job on the Jisco furnace of the Jackson Iron & Steel Co., manufacturers of ferrosilicon and silvery pig iron, turns out to be the construction of a complete new stack. The old stack, which went out of blast last week, will be completely removed and a modern furnace will be constructed, equipped with air conditioning by the Carrier Corp.

While the new stack is being constructed, Jisco customers will be supplied by the Globe Iron Co., of Jackson, and the Hanna Furnace Corp., Buffalo, under instructions from WPB. Construction of the new furnace is expected to take about three months.

## Weekly Bookings of Construction Steel in Tons

Week Ended	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941	Year to Date	
					1942	1941
Fabricated structural steel awards	33,500	23,100	5,125	27,400	314,010	451,085
Fabricated plate awards	0	0	2,000	780	10,650	49,785
Sheet steel piling awards	0	0	0	0	790	13,880
Reinforcing bar awards	37,950	30,650	31,000	16,100	482,475	168,800
Total letting of Construction Steel	71,450	53,750	38,125	44,280	807,925	683,550

## Record Plate Output Claimed by C-I Mill

••• Further evidence of the all-out war effort is found in a new world's record for plate production claimed by Carnegie-Illinois Steel Corp., on its 100-in. continuous plate mill in the Pittsburgh area. The mill crew during March turned out 72,500 tons of plate, exceeding its own previous record by more than 9000 tons.

Workmen on two additional plate mills also scored records in March, one of 34,831 tons of plate on a 140-in., three-high, single stand mill, and 22,200 tons of plate on a

48-in. Universal type plate mill. Both of these experiences exceeded January production on these units by 2000 tons.

## J. & I. Strip Mill Makes 104,000 Tons in March

### Pittsburgh

••• Jones & Laughlin strip mill, it is understood, produced more than 104,000 tons of flat rolled material during the month of March, thus bettering its previous record of 99,000 tons. This mill was originally built for a theoretical capacity of 60,000 to 70,000 tons per month.

# MARVEL SAWS

## LOW COST—HIGH SPEED

### MARVEL

MARVEL 4-B shaper action high speed Hack Saw.  
Screw-feed. Ball bearing saw frame.  
Quick action vise.  
Cuts 6" cold-rolled bar in 8 minutes  
—other sizes in proportionate time.

### MARVEL

The performance of MARVEL 4-B is high speed cutting with low cost operation because it will out-cut any other saw in its price class. Has draw-cut and lift return giving blade longer life. Has accurate, rigid frame action. 6" x 6" capacity and a speed of 149 strokes per minute. MARVEL 4-B may be had with cabinet base and with 4 speeds.

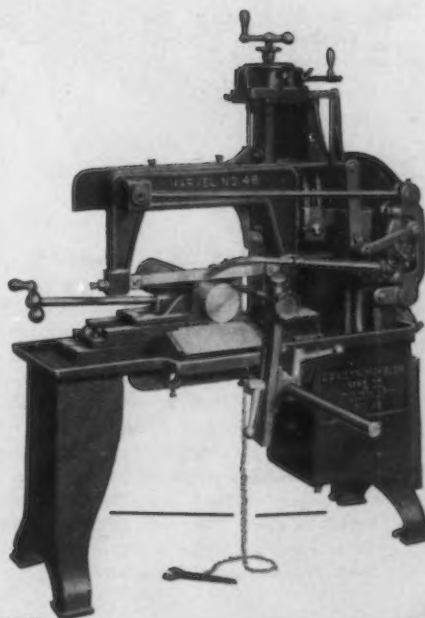
### BUY FROM YOUR LOCAL DISTRIBUTORS

Write for Bulletin about these low cost machines featuring speed and efficiency.

### ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"  
5700 Bloomingdale Ave.  
Chicago, U.S.A.

Eastern Sales Office:  
225 Lafayette St., New York





# MACHINE TOOLS

... SALES, INQUIRIES AND MARKET NEWS

## Too Many Automatics Seen Used on Shells

Chicago

... Some leading machine tool executives in this sector, who have been serving the government more or less as trouble shooters and hence get into a lot of shops, are of the opinion that too many automatic machines have been put into shell work all over the country. They point out that standard turret lathes and automatics are needed by the aircraft industry and that shells can be made on simplified, single purpose machines.

The idea is by no means new—special machines for shell production have been discussed long before this country was even close to actual war. As the industry knows, it was almost decided to design special machines so simple in construction that anyone could build it and when the war was

over, throw the model on the junk heap if necessary.

But nothing was done about the idea, and though several lathe companies, notably South Bend and Gisholt in this area are about ready to launch simplified war models, many multi-operation machines have been shipped for simple operation jobs. There are clear indications now, though, that much of this will be or has already stopped. Many new ammunition contractors are known to have swung into production by adapting their equipment on hand.



## Shell Bottleneck Broken

Cleveland

... A swiftly developing but increasingly serious bottleneck in shell turning lathes is expected to be relieved within the next 60 days by the action of Federal authorities and machine tool manufacturers in increasing the number

of concerns producing such equipment. At present, recipients of shell contracts are faced with a nine-month wait for delivery on drill presses and shell turning lathes. Accordingly, various manufacturers in different areas have been designated to produce such equipment and to get into immediate operation along these lines.

In the Ohio area, the Cleveland Duplex Machinery Co. will bring out a new shell lathe for small shells, ranging from 20-mm. up to 37-mm. and 40-mm., and also for fuse component parts. In addition, the same company will make available a shell knurling machine, to be manufactured for the company by the F. A. Smith Co. Delivery on these new machines will be from eight to nine weeks.

It is reported that another wave of incendiary bomb orders has been placed and most of them with companies who had participated in the original order for this equipment.

Machine tool observers who are critical of the Stanley coding plan believe that it may lead to difficulties due to various interpretations of the machining ability of different machine tools. Thus, the experience and knowledge of the coder of each piece of equipment will largely influence the adaptability of such machines to war work, so that an inadequately coded item might easily be overlooked in the search for sorely needed war machines.

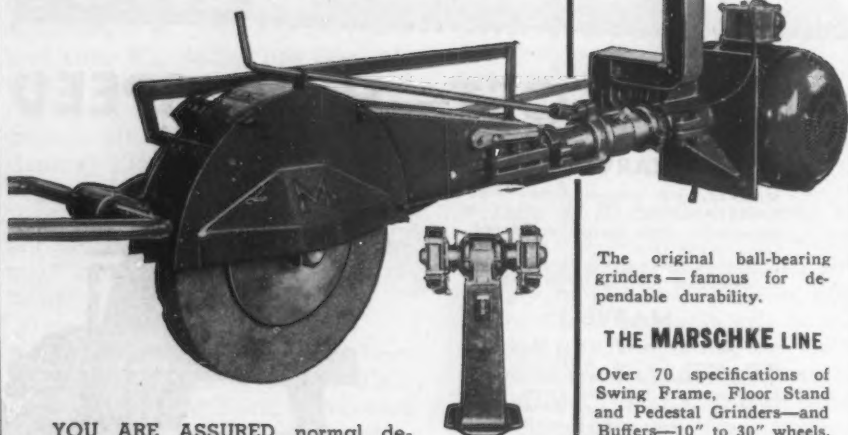


## Older Men Employed

Cincinnati

... A tendency to employ older men in tool shops in this area has been noticed in recent months. This arises primarily from the fact that machine tool executives of this area are seeking to cooperate with draft boards and not to take on men who might be otherwise required for military service. Gradual increase in the number of men employed also is noted and while third shifts are still not completely manned, executives indicate they are gradually building up all of the shifts.

## GOOD DELIVERIES



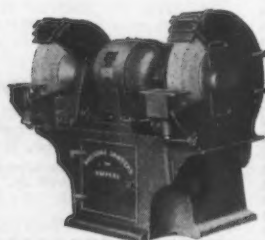
YOU ARE ASSURED normal deliveries or better on orders for Marschke Grinders and Buffers. We have stripped for action, for the duration. By expanding our plant and discontinuing manufacture of other machines we have multiplied Marschke production capacity many times. Marschke quality is maintained, but Marschke quantity is increased. You can count on getting Marschkes when you want them. And you can rely on superb Marschke economy and efficiency after you get them. Write for the Marschke Catalog, or for the name of your local Marschke representative.

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# NON-FERROUS METALS

... MARKET ACTIVITIES AND PRICE TRENDS

## New Curbs Placed

### On Use of Metals

... As the war progresses and materials become tighter, there is an obvious tightening up of supplies and curtailment of those used for anything except military commodities. This week, about a dozen limitation orders were issued, cutting the civilian use of various scarce materials down to the barest essentials. In addition, William L. Batt of WPB stated that civilian use of copper will be cut about 60 per cent from the consumption of 1940, and a large portion of the remainder will be used to "support the military establishment." Further indicating the tightening up by WPB were the seizures of 78,000 lb. of sheet copper from the Allentown, Pa., and Peru, Ill., warehouses of J. M. Katz, New York; and 1000 lb. of high grade aluminum ingots from J. C. Kline & Co., Easton, Pa. The material was requisitioned because the owners refused to accept an offer of purchase by MRC.

The best news received this week, in so far as supplies are concerned, was the statement by the Tin Producers' Association, London, regarding the prospective tin supply to the United Nations. Despite Japanese occupation of the world's major tin sources, the 150,000-ton United States stockpile, plus reserves in Great Britain and probable shipments from the remaining producing areas will insure sufficient supplies of all military and essential civilian needs for at least four years.

Production in unrestricted areas is estimated at 90,000 tons while consumption runs about 125,000 tons a year. According to *Tin*, the association's publication, the annual production should be: 45,000 tons from Bolivia, 15,000 tons from Nigeria, 19,000 tons from Belgian Congo, 2500 tons from the United Kingdom, 3500 tons from Australia, and 5000 tons from other British sources.

Of indicated annual consumption during the next four years, the United States was credited with 75,000 tons, Russia with 15,000 tons, and the United Kingdom with 29,000 tons. Smelter capacity is

believed adequate. Refining capacity at Manone, Belgian Congo, has been enlarged recently, United Kingdom smelters can handle 50,000 tons a year, and the new Texas smelter was originally scheduled to refine about 30,000 tons a year, but will be increased to 52,000 tons.

Local observers, while stating the estimates of the Association are slightly on the optimistic side, agree that tin supplies are rather comfortable. However, there still remains some doubt as to the quality of the tin that will come out of the Texas smelter. While it was originally planned to sweeten the lower grade Bolivian ore with high grade Dutch East Indies ore, this will not be possible.

Contracts with MRC were signed by four large copper smelters for the purchase of yellow brass scrap on a subsidy basis. The MRC will

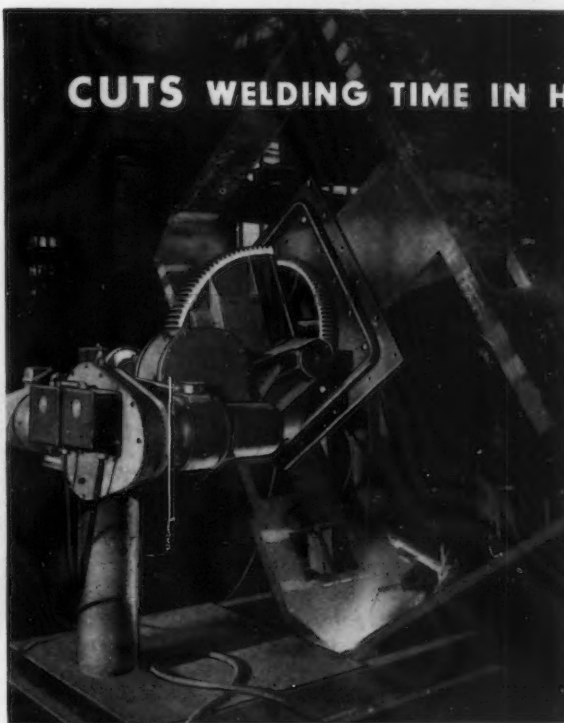
subsidize purchases of some six yellow brass grades to the extent of the difference between the value of the copper content and OPA prices under Schedule No. 20. Territories have been set up on a freight limitation basis, but the program will enable companies to get scrap from any section of the country depending upon supplies and excess refining capacity. The amount of the subsidy will be about 1c to 2c a lb. Revisions to Schedule No. 20 on copper and brass scrap prices are being contemplated by OPA.

Average prices of major non-ferrous metals during March were:

	Cents per lb.
Electrolytic Copper, Connecticut Valley	12.00
Lake Copper, Eastern Delivery	12.00
Straits Tin, Spot, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.65
Lead, St. Louis	6.35
Lead, New York	6.50

## CUTS WELDING TIME IN HALF

ON LOCOMOTIVE FRAMES



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longer need he stand around and wait for crane service to move heavy or cumbersome assemblies. C-F Positioners cut down handling hazards, too. Investigate today. Write for circular WP 20.



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# SCRAP

... MARKET ACTIVITIES AND PRICE TRENDS

## Wide Improvement In Scrap Collection Reported Over Nation

... All major districts report continued seasonal improvement in scrap collections, which will ease for the time being the terrific pressure existing during the last six months.

Meanwhile, large scale wrecking operations gained headway. At Philadelphia a nine-story building will be torn apart to assist the war effort. In Ohio, the government seized 10,000 tons of abandoned scrap. Another interesting event of the past week was the demonstration at Rochester, N. Y., of the melting down of six complete junked autos, described elsewhere in this issue.

A stern warning came from Price

## Finds His Own Stove Contributed to Drive

Allentown, Pa.

... Squire George J. Miller, chairman of the scrap metal drive in nearby Coplay, was enthusiastic about the success of the campaign, but it's left him cold. Someone stole the stove from Squire Miller's office and put it on the scrap metal pile.

Chief Leon Henderson that "There will be no profit in hoarding scrap—only a loss of self-respect by anyone gambling for personal gain at the expense of the common effort to whip our enemies." He said the price of scrap will not be advanced.

## Slag Dump Mining Pushed As Necessity

(Around 1,000,000 tons of metal may be recovered from slag piles over the nation this year, according to responsible estimates. The following dispatch shows that steel company's are really going after the material in earnest.)

Cincinnati

... With only a small backlog of scrap on hand for steel making, Leo F. Reinartz, manager of the Middletown division of the American Rolling Mill Co. said March 31 that emphasis is being placed on the company's "mining" operations in a slag dump to reclaim waste steel.

Mr. Reinartz said the Middletown division and the Hamilton plant are virtually without scrap, and if the supply runs out, Armco will close down at least three of its eight blast furnaces now operating at capacity.

There is an estimated 150,000 tons of steel in a 3,000,000-ton slag dump near the plant. More than 1000 tons of steel are expected to be obtained in the next few days from the dump. Another dump of similar size is located near Armco's plant at Butler, Pa., and efforts are in progress to reclaim steel there.

Capacity operation at the plant, up to this time, is attributed to the turning over, by neighboring communities, of all available scrap.

PITTSBURGH—Scrap was again freer this week, with a better movement being reflected and a high operating rate. For the time being at least the serious aspect of the scrap shortage has been mitigated. A county-wide two day scrap drive is to be launched here April 11 and 12.

CLEVELAND—Sales of nickel-alloy turnings continue to be made below the level previously prevailing, the reduction amounting to \$2 a ton, in effect. Apparently, the oversupply of these turnings in this district has resulted in consumers refusing to pay the low-phos price for them. The betterment in collections of dealer scrap apparently makes consumers more choosy. The Youngstown area continues to suffer from its unfavorable location with respect to scrap, and Republic Steel has taken another furnace off this week, bringing the total

S. A. E.

HY-TEN

**ALLOY  
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of its idle units in Youngstown area to four.

**PHILADELPHIA**—The nine story generating station built in 1889 under the supervision of Thomas A. Edison will be razed shortly to provide 500 tons of iron and steel scrap for ships, tanks and guns, according to the Philadelphia Electric Co., the present owners. One of Philadelphia's first skyscrapers, it was the largest specially designed electric generating building in the world at the time of its construction. The building has been used for storage purposes since 1930.

**CHICAGO**—Scrap continues to move at accelerated levels. The Illinois state bureau of conservation announced that 112,000 tons of scrap have been collected in the state since the bureau started activities. This figure does not represent scrap over and above what would have been collected through regular channels.

**BUFFALO**—Scrap is coming out faster than at any time since last fall. A leading broker declared receipts last week were "at least 60 per cent" ahead of the total for the first week of March. An estimated 4500 tons of scrap already have found their way into dealer yards in the first two and a half weeks of a local drive.

**CINCINNATI**—While the scrap situation in southern Ohio continues tight, there has been no stoppage of production yet. The Middletown unit of American Rolling Mill Co. announced during the week that it was operating on a three-day supply of scrap and might be forced to withdraw furnaces.

**MIDDLETOWN, OHIO**—About 10,000 tons of scrap confiscated by the Federal Government last week near West Carrollton, Ohio, have been acquired by American Rolling Mill Co. The scrap pile was largely defective porcelain enamel parts discarded by the Dayton Frigidaire factory.

**BIRMINGHAM** — The situation continues to improve. The increase is credited in large parts to concerted public scrap drives. The quality of the material is poor.

**ST. LOUIS**—The flow continues at an accelerated pace. Automobile graveyards are furnishing much material. The allocation of 25,000 tons to Granite City Steel Co. has not been completed.

**WASHINGTON**—Pointing out that "the same thing would happen as happened in the aluminum drive," Rear Admiral Howard L. Vickery last week told California bean growers that their offer of scrap metal to "build a ship for Uncle Sam" cannot be accepted. First, he said, the donors would run the risk of not finding a collector. Secondly, it was pointed out, that mills have no facilities for grading, sorting and breaking the scrap.



AP Photo

**SCRAPPED TANKS:** Workmen at Fort George Meade, Md., are dismantling this 50-ton World War I tank to put its scrap metal to use. The tank is one of the 178 being cut up.

**TORONTO**—Dealers report a steady gain in scrap receipts. A city-wide collection campaign started April 8. A nation-wide drive is being arranged for the next few weeks. Tin cans have come into prominence as a source of scrap, at \$5

per ton, with offerings about 15,000 tons weekly. The Northern New Brunswick & Sea Board Railway, Fredericton, N. B., is receiving bids to April 30, for sale of some 17½ miles of track.

**Turn Page for Scrap Prices**



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**Highlights of Quality**

1. Acid Open-Hearth Steel Wire
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There is no guess work when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. If you will tell us how you use wire rope, we shall be glad to suggest the construction and type most suitable for your conditions.

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## SCRAP PRICES

(All the prices given below are per gross tons and are basing point prices from which shipping point prices and consumer's delivered prices are to be computed)

### IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

	BASIC OPEN HEARTH GRADES (No. 1 Heavy Melting; No. 1 Hydr. Com- pressed Black Sheets; No. 2 Heavy Melting; Dealers' No. 1 Bundles; Dealers' No. 2 Bundles; No. 1 Busheling)			BLAST FURNACE GRADES (Mixed Borings and Turnings; Shovelling Turnings; No. 2 Busheling; Cast Iron Borings)			ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES										
	Machine Shop Turnings			Low Phos.			Heavy Structural and Plate			Cut Auto. Steel Scrap			Alloy free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles		
				Billet, Bloom, Forge Crops	Bar Crops and Smaller	Punch- ings and Plate	3 ft. and Under	2 ft. and Under	1 ft. and Under	3 ft. and Under	2 ft. and Under	1 ft. and Under					
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton	\$20.00	\$16.00	\$16.00	\$25.00	\$22.50	\$22.50	\$21.00	\$21.50	\$22.00	\$20.00	\$20.50	\$21.00	\$18.00	\$19.50	\$21.00		
Cleveland, Middletown, Cincinnati, Portsmouth	19.50	15.50	15.50	24.50	22.00	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50		
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Pt.	18.75	14.75	14.75	23.75	21.25	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75		
Ashland, Ky.	19.50	15.50	15.50	24.50	22.00	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50		
Buffalo, N. Y.	19.25	15.25	15.25	24.25	21.75	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25		
Bethlehem, Pa.; Kokomo, Ind.	18.25	14.25	14.25	23.25	20.75	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25		
Duluth, Minn.	18.00	14.00	14.00	23.00	20.50	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00		
Detroit, Mich.	17.85	13.85	13.85	22.85	20.35	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85		
Toledo, Ohio		13.85	13.85														
St. Louis, Mo.	17.50	13.50	13.50	22.50	20.00	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50		
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburg, Cal.; San Francisco	17.00	13.00	13.00	22.00	19.50	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00		
Minnequa, Colo.	16.50	12.50	12.50	21.50	19.00	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50		
Seattle, Wash.	14.50	10.50	10.50	19.50	17.00	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50		
Portland, Ore.					15.50	15.50	14.00	14.50	15.00	13.00	13.50	14.00	11.00	12.50	14.00		

**BUNDLES** with less than 50% tin coated material are \$5 per gross ton below basic open hearth grades; those with more than 50% tin coated material are \$8 below basic open hearth grades.

**PITTSBURGH** basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport. Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakland, Cal.

**MAXIMUM** prices of inferior grades shall continue to bear same differential below corresponding grades as existed during the period Sept. 1, 1940, to Jan. 31, 1941. Superior grades cannot be sold at a premium without approval of OPA. Special preparation charges in excess of the above prices are banned. Whenever any electric furnace or foundry grades are purchased for open hearth or blast furnace use, prices may not exceed the prices above for the corresponding open hearth grades.

**MAXIMUM SHIPPING POINT PRICE**—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad car or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. Published dock charges prevail, or if unpublished 75c. per ton must be included as part of the deduction.\* Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus lowest switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.\* For exceptions see official order.

\*At Memphis deduct 50c.; Great Lakes ports \$1; New England \$1.25.

**REMOTE SCRAP**: Defined as all grades of scrap listed in table above located in North Dakota, South Dakota, Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon and Utah. The delivered price of remote scrap may exceed by more than \$1, but not more than \$5, the price at the basing point nearest the consumer's plant, provided detailed statement under oath is furnished OPA. Where delivered price would exceed by more than \$5 the price at basing point nearest consumer, user must apply to OPA for permission to absorb the additional charges. For exceptions see official order.

**UNPREPARED SCRAP**: The maximum prices established hereinabove are maximum prices for prepared scrap. For unprepared scrap, maximum prices shall be \$2.50 less than the maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge \$2.50 per ton on consumer-owned unprepared remote scrap (see order).

Where scrap is to undergo preparation prior to its arrival at the point of delivery, such scrap is not at its shipping point, as that phrase is defined above, until after preparation has been completed.

**CAST IRON BORINGS**: (No more than 0.5 per cent oil content; for chemical use), add \$5 to price of cast iron borings.

**UNPREPARED CAST IRON SCRAP**—Except for heavy breakable cast, unprepared scrap is given a price ceiling of \$2.50 per ton less than the maximum prices for the corresponding grade of prepared cast iron scrap. Where scrap is to undergo preparation prior to arrival at the point of delivery, such scrap is not considered at shipping point until preparation is completed.

Consumers of cast scrap may pay the shipping point price plus established charge for transporting the scrap to their plants. In the case of deliveries by truck, the cast scrap buyer must obtain from the seller a certification, made out to OPA, of the shipping point, transportation charges and details of the sale.

### RAILROAD SCRAP

(Per gross ton, delivered consumers' plants located on line.)

	Scrap Rails					
	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	3 ft. and Under	2 ft. and Under	18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown						
Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown						
Chicago, Philadelphia, Sparrows Pt., Wilmington, Birmingham, Los Angeles, San Francisco						
Buffalo						
Detroit						
Duluth						
Kansas City, Mo.						
Kokomo, Ind.						
Seattle						
St. Louis						

### CAST IRON SCRAP

(Other Than Railroad Scrap)

	Group A	Group B	Group C
No. 1 machinery cast, drop broken, 150 lbs.			
No. 1 cupola cast	\$18.00	\$19.00	\$20.00
and under	18.00	19.00	20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	17.50	18.50	19.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	16.50	17.50
Charging box size cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B; switch district of Kansas City, Kan., Mo.

# ... Comparison of Prices

(Advances Over Past Week in **Heavy Type**; Declines in *Italics*. Prices Are F.O.B. Major Basing Points)

Flat Rolled Steel: (Cents Per Lb.)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Hot rolled sheets .....	2.10	2.10	2.10	2.10
Cold rolled sheets .....	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip .....	2.10	2.10	2.10	2.10
Cold rolled strip .....	2.80	2.80	2.80	2.80
Plates .....	2.10	2.10	2.10	2.10
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terne Plate: (Dollars Per Base Box)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Tin plate .....	\$5.00	\$5.00	\$5.00	\$5.00
Manufacturing ternes ..	4.30	4.30	4.30	4.30

Bars and Shapes: (Cents Per Lb.)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Merchant bars .....	2.15	2.15	2.15	2.15
Cold finished bars .....	2.65	2.65	2.65	2.65
Alloy bars .....	2.70	2.70	2.70	2.70
Structural shapes .....	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00

Wire and Wire Products: (Cents Per Lb.)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Plain wire .....	2.60	2.60	2.60	2.60
Wire nails .....	2.55	2.55	2.55	2.55

Rails: (Dollars Per Gross Ton)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Heavy rails .....	\$40.00	\$40.00	\$40.00	\$40.00
Light rails .....	40.00	40.00	40.00	40.00

Semi-Finished Steel: (Dollars Per Gross Ton)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Rerolling billets .....	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars .....	34.00	34.00	34.00	34.00
Slabs .....	34.00	34.00	34.00	34.00
Forging billets .....	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

Wire Rods and Skelp: (Cents Per Lb.)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Wire rods .....	2.00	2.00	2.00	2.00
Skelp (grv'd) .....	1.90	1.90	1.90	1.90

Pig Iron: (Per Gross Ton)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
No. 2 fdy., Philadelphia...	\$25.84	\$25.84	\$25.84	\$25.84
No. 2, Valley furnace....	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti...	24.06	24.06	24.06	24.06
No. 2, Birmingham .....	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa...	25.34	25.34	25.34	25.34
Basic, Valley furnace ...	23.50	23.50	23.50	23.50
Malleable, Chicago† ....	24.00	24.00	24.00	24.00
Malleable, Valley .....	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago...	31.34	31.34	31.34	30.34
Ferromanganese† .....	120.00	120.00	120.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.  
‡For carlots at seaboard.

Scrap: (Per Gross Ton)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Heavy melting steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	23.00	23.00	23.00	23.00
No. 1 cast, Pittsburgh...	22.00	22.00	22.00	22.00
No. 1 cast, Philadelphia..	24.00	24.00	24.00	23.75
No. 1 cast, Ch'go*	21.00	21.00	21.00	22.60

\*Changed to gross ton basis April 3, 1941.

Coke, Connellsville: (Per Net Ton at Oven)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Furnace coke, prompt....	\$6.00	\$6.00	\$6.00	\$5.625
Foundry coke, prompt...	6.875	6.875	6.875	6.25

Non-Ferrous Metals: (Cents per Lb. to Large Buyers)	Apr. 7, 1942	Mar. 31, 1942	Mar. 10, 1942	Apr. 8, 1941
Copper, electro., Conn.*..	12.00	12.00	12.00	12.00
Copper, Lake, New York.	12.00	12.00	12.00	12.00
Tin (Straits), New York.	52.00	52.00	52.00	51.75
Zinc, East St. Louis.....	8.25	8.25	8.25	7.25
Lead, St. Louis.....	6.35	6.35	6.35	5.70
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

\*Mine producers only.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 166 to 174 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

# ... Composite Prices

FINISHED STEEL	Apr. 7, 1942
2.30467c. a Lb.....	\$23.61
One week ago.....	\$23.61
One month ago.....	\$23.61
One year ago.....	\$23.61

PIG IRON	Apr. 7, 1942
\$23.61 a Gross Ton.....	\$23.61
One week ago.....	\$23.61
One month ago.....	\$23.61
One year ago.....	\$23.61

SCRAP STEEL	Apr. 7, 1942
\$19.17 a Gross Ton.....	\$19.17
One week ago.....	\$19.17
One month ago.....	\$19.17
One year ago.....	\$19.17

	HIGH	LOW
1942.....	2.30467c.,	2.30467c.,
1941.....	2.30467c.,	2.30467c.,
1940.....	2.30467c., Jan. 2	2.24107c., Apr. 16
1939.....	2.35367c., Jan. 3	2.26689c., May 16
1938.....	2.58414c., Jan. 4	2.27207c., Oct. 18
1937.....	2.58414c., Mar. 9	2.32263c., Jan. 4
1936.....	2.32263c., Dec. 28	2.05200c., Mar. 10
1935.....	2.07642c., Oct. 1	2.06492c., Jan. 8
1934.....	2.15367c., Apr. 24	1.95757c., Jan. 2
1933.....	1.95578c., Oct. 3	1.75836c., May 2
1932.....	1.89196c., July 5	1.83901c., Mar. 1
1931.....	1.99629c., Jan. 13	1.86586c., Dec. 29
1930.....	2.25488c., Jan. 7	1.97319c., Dec. 9
1929.....	2.31773c., May 28	2.26498c., Oct. 29

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

	HIGH	LOW
1942.....	\$23.61	\$23.61
1941.....	\$23.61, Mar. 20	\$23.45, Jan. 2
1940.....	23.45, Dec. 23	22.61, Jan. 2
1939.....	22.61, Sept. 19	20.61, Sept. 12
1938.....	23.25, June 21	19.61, July 6
1937.....	23.25, Mar. 9	20.25, Feb. 16
1936.....	19.74, Nov. 24	18.73, Aug. 11
1935.....	18.84, Nov. 5	17.83, May 14
1934.....	17.90, May 1	16.90, Jan. 27
1933.....	16.90, Dec. 5	13.56, Jan. 3
1932.....	14.81, Jan. 5	13.56, Dec. 6
1931.....	15.90, Jan. 6	14.79, Dec. 15
1930.....	18.21, Jan. 7	15.90, Dec. 16
1929.....	18.71, May 14	18.21, Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	LOW
1942.....	\$19.17	\$19.17
1941.....	\$22.00, Jan. 7	\$19.17, Apr. 10
1940.....	21.83, Dec. 30	16.04, Apr. 9
1939.....	22.50, Oct. 3	14.08, May 16
1938.....	15.00, Nov. 22	11.00, June 7
1937.....	21.92, Mar. 30	12.92, Nov. 10
1936.....	17.75, Dec. 21	12.67, June 9
1935.....	13.42, Dec. 10	10.33, Apr. 29
1934.....	13.00, Mar. 13	9.50, Sept. 25
1933.....	12.25, Aug. 8	6.75, Jan. 3
1932.....	8.50, Jan. 12	6.43, July 5
1931.....	11.33, Jan. 6	8.50, Dec. 29
1930.....	15.00, Feb. 18	11.25, Dec. 9
1929.....	17.58, Jan. 29	14.08, Dec. 3

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



# Prices of Finished Iron and Steel . . .

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars **	Pacific Ports, Cars **	Detroit	New York	Phila- delphia
<b>SHEETS</b>															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled <sup>1</sup>	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes <sup>2</sup>	3.80¢		3.80¢									4.55¢			
<b>STRIP</b>															
Hot rolled <sup>3</sup>	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled <sup>4</sup>	2.80¢	2.90¢					2.80¢		(Worcester = 3.00¢)				2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢			2.95¢			2.96¢		(Worcester = 3.35¢)				3.05¢	3.31¢	
<b>TIN PLATE</b>															
Standard cokes, base box	\$5.00	\$5.00	\$5.00						\$5.10						\$5.32
<b>BLACK PLATE</b>															
29 gage <sup>5</sup>	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (1 <sup>6</sup> )			3.37¢
<b>TERNES, M'FG.</b>															
Special coated, base box	\$4.30	\$4.30	\$4.30						\$4.40						
<b>BARS</b>															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			(Duluth = 2.25¢)		2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel <sup>6</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.39¢	
Reinforcing (rail) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢	2.25¢		2.47¢
Cold finished <sup>8</sup>	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					3.01¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢			(Bethlehem, Massillon, Canton = 2.70¢)				2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
									(Coatesville and Claymont = 2.10¢)						
<b>PLATES</b>															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢ <sup>(11)</sup>		2.45¢	2.65¢	2.25¢	2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢				(Coatesville = 3.50¢)					3.95¢	4.15¢		3.70¢	3.37¢
<b>SHAPES</b>															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			(Bethlehem = 2.10¢)		2.45¢	2.75¢		2.27¢	2.215¢
<b>SPRING STEEL, C-R</b>															
0.26 to 0.50 Carbon	2.80¢			2.80¢					(Worcester = 3.00¢)						
0.51 to 0.75 Carbon	4.30¢			4.30¢					(Worcester = 4.50¢)						
0.76 to 1.00 Carbon	6.15¢			6.15¢					(Worcester = 6.35¢)						
1.01 to 1.25 Carbon	8.35¢			8.35¢					(Worcester = 8.55¢)						
<b>WIRE<sup>9</sup></b>															
Bright	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)			3.10¢			2.92¢
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)			3.10¢			2.92¢
Spring	3.20¢	3.20¢		3.20¢					(Worcester = 3.30¢)			3.80¢			3.52¢
<b>PILING</b>															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢
<b>IRON BARS<sup>12</sup></b>															
Wrought single refined	4.40¢														
Wrought double refined	5.40¢														

<sup>1</sup> Mill run sheets are 10c. per 100 lb. less than base, and primes only, 25c. above base. <sup>2</sup> Unassorted 8-lb. coating. <sup>3</sup> Widths up to 12 in. <sup>4</sup> Carbon 0.25 per cent and less. <sup>5</sup> Applies to certain width and length limitations. <sup>6</sup> For merchant trade. <sup>7</sup> Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. <sup>8</sup> Also shafting. For quantities of 20,000 to 39,999 lb. <sup>9</sup> Carload lot to manufacturing trade. <sup>10</sup> Boxed. <sup>11</sup> Ship plates only. <sup>12</sup> Common iron bars quoted at 2.15c. by Terre Haute, Ind., producer. <sup>13</sup> Gulf and Pacific Ports prices shown here do not apply if the customary means of transportation (rail and water) is not used.

**High Speed Steel, Tungsten-Molybdenum Type**  
(COMPARABLE TO DISSTON 6-N-6)

**CONSERVATION CONTROL CARD No. 40**

**How to obtain better results in working steel.**

FAILURE	CAUSE	CORRECTION
Breakage	Improper hardening—grain coarse or dry.	If grain is not very fine and silky (No. 9.5 or No. 10), tool has probably been held too long at high heat or has not been drawn correctly.
	Grinding checks—a network of fine cracks.	Consult your abrasives supplier as to proper wheel and procedure. An additional 1/2 hour draw at 500-700° F. after finishing grinding materially toughens the tool.
	Improper set-up.	Support tool firmly to avoid wobble or chatter. Clearance and angle of cut must be accurate and tool must be kept sharp.
Rapid wear	Improper selection of steel.	
	Decarburization face of tool the file.	

(CONTINUED)

Correct use of tools... makes work easier.

**High Speed Steel, Tungsten-Molybdenum Type**  
(continued)

**WORKING INSTRUCTIONS**

<b>FORGING</b>	Heat slowly to between 1400° and 1600° F. and anneal before hardening.
<b>ANNEALING</b>	Pack anneal in clean, dry oil, F., soak thoroughly and normalize.
<b>HARDENING</b>	Preheat at 1600° F., soak 15-20 min., then quench in 2250-2275° F. and quench in dry air blast.
<b>TEMPERING</b>	The best practice is to draw file, cool to room temperature, then temper.
<b>GRINDING</b>	Use care in grinding. Avoid too free-cutting wheel and light clogging of wheel.

**CONSERVATION SERVES EVERYONE**

HENRY DISSTON & SONS, INC.

**THE DISSTON PLAN**  
to Save Valuable  
Time and Materials  
features these **FREE**

## CONSERVATION CONTROL CARDS on TOOL STEELS

The Disston Conservation Control Plan is a nationwide program to conserve essential tools and materials, to reduce unproductive delays and to speed war time output.

An important feature of the Plan is individual instruction cards with expert information on how to get the best results in working any of six different types of tool steels. Each card covers failures, causes and corrections—and on the reverse side gives working directions.

You do not have to be a user of Disston products to get these cards *without charge*. State the cards desired and the quantity needed on the coupon and you will receive the cards promptly, along with complete information on the Disston Conservation Control Plan. This is the Plan about which George T. Weymouth, Bureau of Conservation, says: "This effort reflects precisely what we would have every industrial plant in the country undertake. The entire program, therefore, meets with our approval."

If you have not received your free copy of the illustrated 73-page book, "Disston Tool Steels," write to Henry Disston & Sons, Inc., 419 Tacony, Philadelphia, Pa., U. S. A.



Henry Disston & Sons, Inc.,  
419 Tacony,  
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Please send me, without cost, the  
DISSTON CONSERVATION

CONTROL CARDS on the TOOL STEELS indicated below:

Quantity	Card	Type
.....	No. 40	High Speed Steel, Tungsten-Molybdenum Type (Comparable to Disston 6-N-6)
.....	No. 41	Water-Hardening Carbon or Carbon Vanadium Tool Steel (Comparable to Disston Best Tool or V-tool Steel)
.....	No. 42	Air-Hardening, High-Carbon High Chromium Steel (Comparable to Disston Croloy)
.....	No. 43	Oil-Hardening Tool Steel (Comparable to Disston Mansil)
.....	No. 44	Chrome-Tungsten Chisel Steel (Comparable to Disston Keystone)
.....	No. 45	Nickel-Chrome, Oil-Hardening Tool Steel (Comparable to Disston Nicroman No. 827)

Company.....  
Street.....  
City..... State.....  
Attn:..... Position.....



# PRICES

## SEMI-FINISHED STEEL

### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2 higher; f.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton  
Rerolling .....\$34.00  
Forging quality ..... 40.00

### Shell Steel

Basic open hearth shell steel, f.o.b. Pittsburgh and Chicago.

Per Gross Ton  
3 in. to 12 in. ....\$52.00  
12 in. to 18 in. .... 54.00  
18 in. and over ..... 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity.

### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton  
Open hearth or bessemer .....\$34.00

### Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.  
Grooved, universal and sheared 1.90c.

### Wire Rods

(No. 5 to 9/32 in.) Per Lb.  
Pittsburgh, Chicago, Cleveland. 2.00c.  
Worcester, Mass. .... 2.10c.  
Birmingham ..... 2.00c.  
San Francisco ..... 2.50c.  
Galveston ..... 2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

### Alloy Steel Blooms, Billets and Slabs

Per Gross Ton  
Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem .....\$54.00

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse) Base per Lb.

High speed ..... 67c.  
Straight molybdenum ..... 54c.  
Tungsten-molybdenum ..... 57½c.  
High-carbon-chromium ..... 43c.  
Oil hardening ..... 24c.  
Special carbon ..... 22c.  
Extra carbon ..... 18c.  
Regular carbon ..... 14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

## WAREHOUSE PRICES (Delivered Metropolitan areas, per 100 lb. See THE IRON AGE, Dec. 25, 1941, page 88, for details of OPA Price Schedule No. 49, covering steel resale prices. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. city prices are used in conformance with Schedule 49.)

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St. Paul	Milwaukee	Los Angeles
Sheets, hot rolled .....	\$3.35	\$3.25	\$3.35	\$3.55	\$3.58	\$3.43	\$3.25	\$3.71	\$3.45	\$3.39	\$3.50	\$3.38	\$4.95
Sheets, cold rolled .....	4.10	4.05	4.05	4.05	4.60	4.30	4.30	4.68	4.24	4.24	4.90	4.23	7.50
Sheets, galvanized .....	4.65	4.85	4.62	5.05	5.00	4.84	4.75	5.11	4.75	4.99	5.00	4.98	5.95
Strip, hot rolled .....	3.60	3.60	3.50	3.51	3.96	3.68	3.82	4.06	3.70	3.74	3.85	3.73	4.90
Strip, cold rolled .....	3.20	3.50	3.20	3.31	3.51	3.40	3.52	3.46	3.61	3.83	3.54	3.54	4.90
Plates .....	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.55	3.69	3.80	3.68	4.90
Structural shapes .....	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.60
Bars, hot rolled .....	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	4.35
Bars, cold finished .....	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.85	6.60
Bars, ht. rld. SAE 2300 .....	7.45	7.35	7.55	7.31	7.60	7.67	7.35	7.75	7.75	7.72	7.45	7.58	9.55
Bars, ht. rld. SAE 3100 .....	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	6.05	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300 .....	8.40	8.40	8.40	8.56	8.84	8.70	8.40	8.88	8.88	8.77	8.84	8.63	10.55
Bars, cd. drn. SAE 3100 .....	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	7.23	7.12	7.44	6.98	9.55

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb., cold rolled strips, 0.0971 in. thick; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., cold rolled strip 0.095 in. and lighter; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb.; New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations. \*12 gage and heavier, \$3.43.

## PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices are delivered quotations per gross ton computed on the basis of the official maxima.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorous	Charcoal
Boston .....	\$25.50	\$25.00	\$26.50	\$26.00	.....	.....
Brooklyn .....	27.50	.....	.....	28.00	.....	.....
Jersey City .....	26.53	26.03	27.53	27.03	.....	.....
Philadelphia .....	25.84	25.34	26.84	26.34	.....	.....
Bethlehem, Pa. ....	\$25.00	\$24.50	\$26.00	\$25.50	.....	.....
Everett, Mass. ....	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa. ....	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa. ....	.....	24.50	.....	.....	\$29.50	.....
Birdsboro, Pa. ....	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md. ....	25.00	24.50	.....	.....	.....	.....
Erie, Pa. ....	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa. ....	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.* ..	24.00	23.50	24.50	24.00	.....	.....
Buffalo .....	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati .....	24.44	24.61	.....	25.11	.....	.....
Canton, Ohio .....	25.39	24.89	25.89	25.39	.....	.....
Mansfield, Ohio .....	25.94	25.44	26.44	25.94	.....	.....
St. Louis .....	24.50	24.02	.....	.....	.....	.....
Chicago .....	24.00	23.50	24.50	24.00	.....	381.
Granite City, Ill. ....	24.00	23.50	24.50	24.00	.....	.....
Cleveland .....	24.00	23.50	24.50	24.00	.....	.....
Hamilton, Ohio .....	24.00	23.50	.....	24.00	.....	.....
Toledo .....	24.00	23.50	24.50	24.00	.....	.....
Youngstown* .....	24.00	23.50	24.50	24.00	.....	.....
Detroit .....	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc. ....	.....	.....	.....	.....	.....	\$28.00
Lyles, Tenn. fc.† ..	.....	.....	27.13	26.63	.....	33.00
St. Paul .....	26.63	.....	.....	.....	.....	.....
Duluth .....	24.50	.....	25.00	24.50	.....	.....
Birmingham .....	20.38	19.00	25.00	.....	.....	.....
Los Angeles .....	27.50	.....	.....	.....	.....	.....
San Francisco .....	27.50	.....	.....	.....	.....	.....
Seattle .....	27.50	.....	.....	.....	.....	.....
Provo, Utah .....	22.00	.....	.....	.....	.....	.....
Montreal .....	27.50	27.50	.....	28.00	.....	.....
Toronto .....	25.50	25.50	.....	26.00	.....	.....

## GRAY FORGE IRON

Valley or Pittsburgh furnace ..... \$23.50

\*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade (1.75 per cent to 2.25 per cent).

Phosphorous Differential: Basing point prices are subject to a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over.

†Price shown is for low-phosphorous iron; high-phosphorous sells for \$28.50 at the furnace.

Manganese Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

# Engineered Production



## Sundstrand Solves Tough Production Problems

**A Problem . . .** Shaft shown above was being turned out on bar stock  $1\frac{7}{8}$ " diameter by 9' long in 30 minutes on modern machine tool. Higher production and economy were required . . . but machine and operator were already working to capacity. This, and turning in lots of only 200 at present, made a tough problem.

**Solved . . .** Engineered Production on Sundstrand Automatic Lathe solved this problem. Turning is divided into four successive operations. Set-up and change-over are so simple, cutting speeds and rapid traverse so fast, that

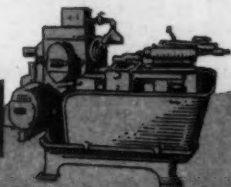
total Sundstrand turning time is 15.8 minutes per shaft, saving 14.2 minutes each. Sundstrand automatic cycle makes operator's part of this job easier, frees 50% of his time for other work.

**Plus Values . . .** Nineteen other different work-pieces are turned on this lathe, with similar savings on all. Sundstrand tool relief reduces wear on front tools, eliminates drag marks. Sundstrand Engineered Production Service is available to all shops, small or large, to increase production, cut costs, and save labor on turning and milling. Investigate.

## Sundstrand Machine Tool Co.

2539 Eleventh Street, Rockford, Illinois, U. S. A.

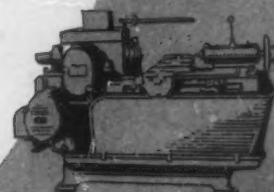
Model 8 Automatic Stub Lathe



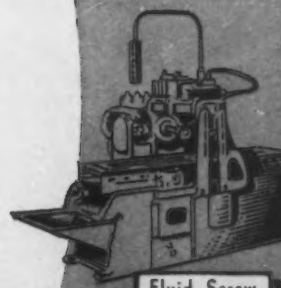
Model 10 Automatic Stub Lathe



Model 12 Automatic Stub Lathe



Fluid-Screw Rigidmil



No. 1 Rigidmil



No. 0 Rigidmil



No. 00 Rigidmil



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In their respective fields, Sundstrand machine tools are unexcelled for high production, accuracy, and lasting value. Write for complete details.



## RIGIDMILS · STUB LATHES

Hydraulic Operating Equipment — Drilling and Centering Machines



## PRICES

### CORROSION AND HEAT- RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

#### Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

#### Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F. Billets	15.73c.	16.15c.	19.13c.	23.38c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	25.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

#### Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

\*Includes annealing and pickling.

### ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
*Motor	4.95c.
*Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 75c. per 100 lb.

\*In some instances motor grade is referred to as dynamo grade and dynamo grade is referred to as dynamo special.

### ROOFING TERNE PLATE

(F.o.b. Pittsburgh, per  
Package of 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	\$6.00	\$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

### BOLTS, NUTS, RIVETS, SET SCREWS

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)  
Per Cent Off List

#### Machine and Carriage Bolts:

6½ in., shorter and smaller	65½
6 x ⅝ in., and shorter	63½
6 in. by ¾ to 1 in. and shorter	61
1½ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

#### Nuts, Cold Punched or Hot Pressed: (Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1½ to 1½ in. inclusive	57
1½ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	62	64
½ in. and smaller	62	60
½ in. through 1 in.	59	57
9/16 to 1 in.	59	58
1½ in. through 1½ in.	57	58
1½ in. and larger	56	56

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose	71 and 10
Stove bolts in packages, with nuts attached	71
Stove bolts in bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York lots of 200 lb. or over.

#### Large Rivets

(½ in. and larger)

	Base per 100 lb.
F.o.b. Pittsburgh, Cleveland Chicago, Birmingham	\$3.75

#### Small Rivets

(7/16 in. and smaller)

	Per cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

#### Cap and Set Screws

Per cent Off List

Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	68
Milled studs	40
Flat head cap screws, listed sizes	30
Filister head cap, listed sizes	46

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

### WIRE PRODUCTS

(To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

	Base per Keg
Standard wire nails	\$2.55
Coated nails	2.55
Cutnails, carloads	3.85

	Base per 100 Lb.
Annealed fence wire	\$3.05

	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

\*15½ gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

### BOILER TUBES

Seamless Steel and Lap Weld Commercial  
Boiler Tubes and Locomotive Tubes  
Minimum Wall  
(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless	Lap Weld,
	Cold Drawn	Hot Rolled
	\$	\$
2 in. o.d. 13 B.W.G.	15.03	13.04
2½ in. o.d. 12 B.W.G.	20.21	17.54
3 in. o.d. 12 B.W.G.	22.48	19.50
3½ in. o.d. 11 B.W.G.	28.37	24.62
4 in. o.d. 10 B.W.G.	35.20	30.54

	Base
40,000 lb. or ft. over	5%
30,000 lb. or ft. to 39,999 lb. or ft.	10%
20,000 lb. or ft. to 29,999 lb. or ft.	20%
10,000 lb. or ft. to 19,999 lb. or ft.	30%
5,000 lb. or ft. to 9,999 lb. or ft.	45%
2,000 lb. or ft. to 4,999 lb. or ft.	65%
Under 2,000 lb. or ft.	65%

(Extras for less carload quantities)

### STEEL AND WROUGHT IRON PIPE AND TUBING

#### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District  
and Lorain, Ohio, Mills  
(F.o.b. Pittsburgh only on wrought pipe)

Base Price—\$2.00 Per Net Ton

#### Steel (Butt Weld)

	Black	Galv.
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½

#### Wrought Iron (Butt Weld)

½ in.	24	3½
¾ in.	30	10
1 and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18

#### Steel (Lap Weld)

2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½

#### Wrought Iron (Lap Weld)

2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17

#### Steel (Butt, extra strong, plain ends)

	Black	Galv.
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57

#### Wrought Iron (Same as Above)

½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½

#### Steel (Lap, extra strong, plain ends)

2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56

#### Wrought Iron (Same as Above)

2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld 8 in. and smaller.

### CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago.

### FUEL OIL


No. 3, f.o.b. Bayonne, N. J.	5.20c.
No. 6, f.o.b. Bayonne, N. J.	3.21c.
No. 6 Bur. Stds., del'd Chicago	4.50c.
No. 3 distillate del'd Cleveland	6.50c.
No. 4 indus., del'd Cleveland	6.00c.
No. 6 indus., del'd Cleveland	5.00c.

**SHEARED STEEL  
PLATES-FLANGED  
AND DISHED HEADS**




**ALL INGOTS ARE BOTTOM POURED**






**WORTH**

**SHEARED STEEL PLATES  
FLANGED AND DISHED HEADS ♦**





**WORTH STEEL COMPANY • Claymont, Del.** REPRESENTATIVES:

New York, N. Y., Wm. C. Dickey • Pittsburgh, Pa., McKee-Oliver, Inc. • St. Louis, Mo., Hubbell & Co.  
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Los Angeles, Calif., Ducommun Metals & Supply Co. • Seattle, Wash., Barde Steel Co. • Portland, Oregon, Barde Steel Co. • Montreal and Toronto, Canada, Drummond, McCall & Co., Ltd.



# PRICES

## FERROALLOYS

### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads) .....\$120.00

### Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....\$36.00  
Domestic, 26 to 28%..... 49.50

### Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)

50% (carload lots, bulk).....\$74.50  
50% (ton lots, packed)..... 87.00  
75% (carload lots, bulk).....135.00  
75% (ton lots, packed).....151.00

### Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 Si)

F.o.b. Jackson, Ohio.....\$29.50\*  
Buffalo .....30.75\*  
For each addition 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorus or over.  
\*Official OPACS price established June 24.

### Bessemer Ferrosilicon

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

### Ferrochrome

(Per Lb., Contained Cr, Delivered Carlots, Lump Size, on Contract)

4 to 6 carbon.....13.00c.  
2 carbon .....19.50c.  
1 carbon .....20.50c.  
0.10 carbon .....22.50c.  
0.06 carbon .....23.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

### Silico-Manganese

(Per Gross Ton, Delivered, Lump Size, Bulk, on Contract)

3 carbon .....\$113.00\*  
2.50 carbon ..... 118.00\*  
2 carbon ..... 123.00\*  
1 carbon ..... 133.00\*

### Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload..... \$2.00  
Ferrotungsten, 100 lb. and less 2.25  
Ferrovanadium, contract, per lb. contained V, del'd \$2.70 to \$2.90†  
Ferrochromium, per lb. contained Cr, f.o.b. Niagara Falls, N. Y., ton lots..... \$2.25†  
Ferrocobalt, 15-18 Ti, 7-8 C, f.o.b. furnace, carload, contract, net ton.....\$142.50  
Ferrocobalt, 17-20 Ti, 3-5 C, f.o.b. furnace, carload, contract, net ton.....\$157.50  
Ferrophosphorus, electric or blast furnace material, carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage freight, equalized with Rockdale, Tenn., gross ton..... \$58.50  
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage, freight equalized with Nashville, gross ton..... \$75.00  
Ferromolybdenum, per lb. Mo, f.o.b. furnace ..... 95c.  
Calcium molybdate, per lb. Mo, f.o.b. furnace..... 80c.  
Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa.... 80c.  
Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Langeloth, and Washington, Pa. 80c.

\*Spot prices are \$5 per ton higher.

†Spot prices are 10c. per lb. of contained element higher.

## ORES

### Lake Superior Ores (51.50% Fe.)

(Delivered Lower Lake Ports)

Per Gross Ton

Old Range, bessemer, 51.50....\$4.75  
Old range, non-bessemer, 51.50. 4.60  
Mesaba, bessemer, 51.50..... 4.60  
Mesaba, non-bessemer, 51.50.... 4.45  
High phosphorus, 51.50..... 4.35

### Foreign Ores\*

(C.i.f. Philadelphia or Baltimore, Exclusive of Duty)

Per Unit

African, 46-48 Mn.....66.5c. to 68c.  
Indian, 48-50 Mn. ....68c. to 70c.

Brazilian, 46-48 Mn.....67c. to 68c.  
Cuban, 51 Mn. ....81c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered....\$24 to \$26  
Tungsten, domestic scheelite, at mine .....\$24.00 to \$25.00  
Chrome ore, lump, c.i.f. Atlantic Seaboard, per gross ton; South African (low grade)..\$28.00  
Rhodesian, 45 .....Nom.  
Rhodesian, 48 .....Nom.

\*Importations no longer readily available. Prices shown are nominal.

## COKE\*

### Furnace

Per Net Ton

†Connellsville, prompt .....\$6.00

### Foundry

†Connellsville, prompt..\$6.75 to \$7.00

\*Maximum by-product coke prices established by OPA became effective Oct. 1, 1941. A complete schedule of the ceiling prices was published in THE IRON AGE, Sept. 25, p. 94B. Maximum beehive furnace coke prices established by OPA, Jan. 26. †F.O.B. oven.

By-product, Chicago .....\$12.25  
By-product, New England....\$13.75  
By-product, Newark. . \$12.40 to \$12.95  
By-product, Philadelphia .....\$12.38  
By-product, Cleveland .....\$12.30  
By-product, Cincinnati .....\$11.75  
By-product, Birmingham .....\$8.50†  
By-product, St. Louis .....\$12.02  
By-product, Buffalo .....\$12.50

## RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton.....\$40.00  
Angle bars, 100 lb..... 2.70  
(F.o.b. Basing Points) Per Gross Ton  
Light rails (from billets).....\$40.00  
Light rails (from rail steel).... 39.00  
Base per Lb.  
Cut spikes ..... 3.00c.  
Screw spikes ..... 5.15c.  
Tie plates, steel ..... 2.15c.  
Tie plates, Pacific Coast..... 2.30c.  
Track bolts, heat treated, to railroads ..... 5.00c.  
Track bolts, jobbers discount.. 63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

## FLUORSPAR

### Fire Clay Brick

Per Net Ton

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail .....\$25.00  
Domestic, f.o.b. Ohio River landing barges ..... 25.00  
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines ..... 25.00  
Foreign, 85% calcium fluoride, not over 5% Si, c.i.f. Atlantic ports, duty paid.....Nominal  
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines....\$34.00  
As above, in bags, f.o.b. same mines ..... 36.40

## REFRACTORIES

(F.o.b. Works)

### Fire Clay Brick

Per 1000

Super-duty brick, St. Louis...\$64.60  
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois ..... 51.30  
First quality, New Jersey..... 56.00  
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois ..... 46.55  
Second quality, New Jersey... 51.00  
No. 1, Ohio..... 43.00  
Ground fire clay, net ton..... 7.60

### Silica Brick

Pennsylvania .....\$51.30  
Chicago District ..... 58.90  
Birmingham ..... 51.30  
Silica cement, net ton (Eastern) 9.00

### Chrome Brick

Per Net Ton

Standard, f.o.b. Baltimore, Plymouth Meeting and Chester...\$54.00  
Chemically bonded, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. .... 54.00

### Magnesite Brick

Standard f.o.b. Baltimore and Chester .....\$76.00  
Chemically bonded, f.o.b. Baltimore ..... 65.00

### Grain Magnesite

Domestic, f.o.b. Baltimore and Chester in sacks.....\$44.00  
Domestic, f.o.b. Chewelah, Wash. (in bulk) ..... 22.00